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Products finishing Contents

Volume 13 DECEMBER, 1948 Number 3

Editorial 19

Plating Decorative Automotive Hardware..... 20
By Henry R. Hawkinson

Engineered Purchase Specifications Aid Industry, Business, and Government 26

Electro-Spray Finishing of Tackle Boxes.....32
By C. M. Long

Barrel Finishing of Metal Products
By H. Leroy Beaver

Part 26—Barrel Finishing and Its Relation to the Stability of Electrodeposited Surfaces.....38

Finishing Washer Tubs and Machines.....54
By R. A. Moore

Finishing Clinic
By Dr. Allen G. Gray

—Recent Engineering Developments in Piping and Heating Plating Baths 60

—Methods and Equipment for Baking Organic Coatings 74

—Some Effects of Surface Active Agents in Metal Cleaning 78

—Proper Spray Gun Technique Essential for Economical Finishing 84

News of the Industry.....88

Finishes That Aid in Appearance and Utility.....106

New Equipment, Materials, Processes 108

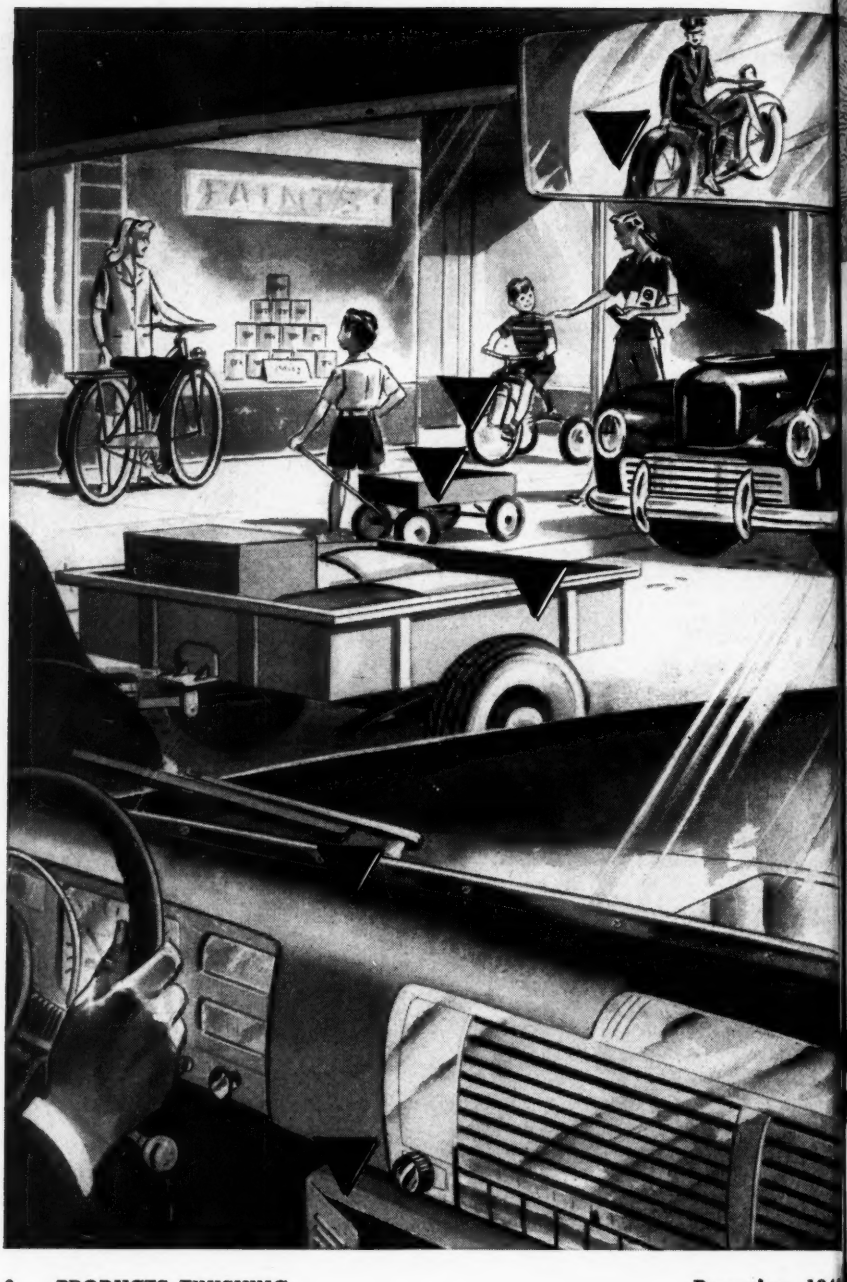
Article Index, 1948 132

Opportunity Section 135, 136

The Finishing Touch 137

Catalog Library 138

Index to Advertisements 140

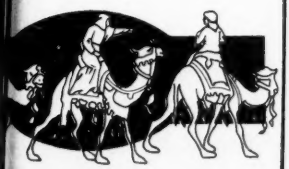

PAINTS

PRODUCTS finishing

Very Merry Christmas . . .

Christmas brings a welcome "breathing spell" at the year-end—a time to review past months and to recall how much success depends upon the friendly cooperation of those we serve. Christmas is the season of giving. We of the staff of PRODUCTS FINISHING desire to give of ourselves; our ability, our knowledge, and our efforts to aid in the dissemination of information involving standard finishing techniques and new developments in equipment, materials, and processes for the finishing of metal products.

Christmas is the season of good cheer; a time to exchange greetings and good wishes. Sincere in our desire to render a distinct service to those engaged in the finishing field, and mindful of the contribution to that service made by our readers, advertisers, and contributors, we of PRODUCTS FINISHING extend to our many friends our best wishes for Christmas and for success in the New Year.



DECEMBER, 1948 Vol. 13, No. 3

Plating Decorative Automotive Hardware

Post-war industrial development on the West Coast has featured the installation or modernization of plants to supply parts for automotive assembly operations. One such modernization program is described in this article.

By HENRY R. HAWKINSON
General Superintendent, Cannon Electric Development Company

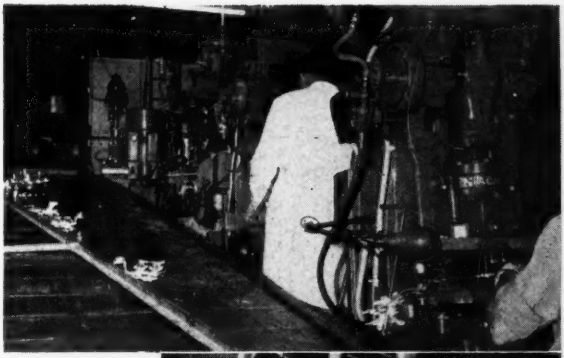
PF FEATURE

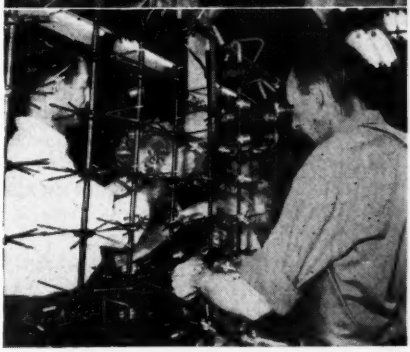
A completely new plating installation has made possible Cannon Electric Development Company's entry into the mass production of decorative hardware for the Ford Motor Company. With 34 years' experience in the electrical and die casting business, small precision parts were no mystery to the Cannon Company. However, the number of parts that were to be processed in the Ford order called for streamlining in all the departments affected, and since each Ford part required plating, Cannon's new undertaking required a completely new plating department capable of handling the large volume of production.

The volume of production, representing steady repeated monthly runs justified special tooling and special arrangement of existing tools and machinery. Necessary changes were made in the die casting foundry since zinc castings were specified for most of the Ford hardware. Wherever possible, mechanized movement of parts was planned, not only in the die cast foundry, as illustrated in Fig. 1, but also in the buffing department where two automatic buffing machines were installed.

The first of these machines is a straight-line, double-lane machine with ten buffing wheels, five on each side. The conveyor bed travels down one side of the machine and returns

on the other side. On this conveyor, oval in shape, there are forty stations where demountable fixtures may be placed, and these fixtures, designed in the general shape of the parts, act as holding jigs for the parts in process. Loaded at one end of the ellipse, the parts travel the length of the machine under the five buffing wheels, so set that all contours of the part will be buffed. At the end of the machine, instead of making a circle turn, the fixtures are arranged so that they swing with the return and make the return trip backing up. This arrangement serves to present the opposite faces of the parts to the working surfaces of the five wheels on the return trip. Arriving at the same end of the machine at which they were loaded, the parts are removed from the fixture, as shown in Fig. 2, buffed on all critical surfaces.





Another machine, purchased locally and built to Cannon specifications, is used to handle those hard-to-do spherical or nearly round parts that generally present more difficult buffing problems. This machine has six buffing stations around a rotary table. On the table are sixteen vertical holding fixtures distributed around its perimeter. The machine is hand-loaded by slipping the parts over erect stud fixtures. As the bed rotates, it carries the parts under the revolving polishing wheels set at various angles to make contact with all surfaces. When each part has made a complete circuit of the table, the operator removes the part and reloads the fixture.

Considerable care is used in producing the zinc castings so that casting surfaces may be buffed easily. The

Fig. 1—(Top) Horizontal belt conveyor transfers die castings from casting machines to second operation.

Fig. 2—(Center) Operator unloading straight line automatic buffing machine

Fig. 3—(Bottom) Parts being loaded for cleaning on plating racks

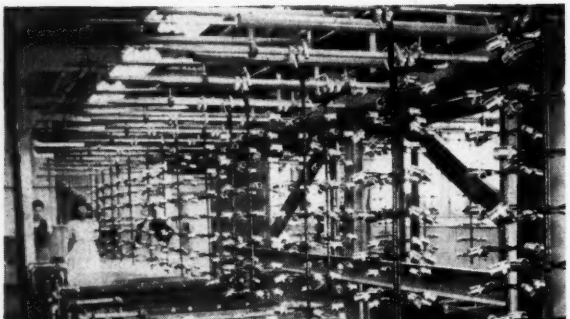


Fig. 4—A view of the automatic cleaning machine in the raised position

thorough, efficient methods of buffing result in delivery to the plating department of exceptionally smooth castings for the plating process.

In the plating department these parts arrive at the racking tables to be placed on racks especially designed to hold them during the plating operation, as illustrated in Fig. 3. Because the castings differ widely in shape, considerable thought was given to the design of the racks. All racks were designed as nearly uniform as possible in order to simplify their manufacture and the later replacement of parts. The hook end of each rack is of rectangular stock. At a point about eight inches from the hook the rectangular section ends. The end is drilled, tapped, and threaded for insertion of a cylindrical bar. The bar forms the trunk of the fixture. At predetermined distances down each trunk are collars that accommodate set screw clamps, and between these clamps, phosphor bronze, spring-wire fingers are held. These holding fingers are of different shapes to accommodate the varying contours of the parts to be held.

Clamps are used to hold these fingers to the rack in order to facilitate replacement, should the fixtures be shorted or damaged in any way. All that is necessary to replace a set of fingers is to remove the Pen-Kote No. 590 rack insulation, unscrew the clamp, and make the necessary repairs. The rack then needs only a spot application of the Pen-Kote to be in service again.

After racking, the parts are ready for treatment in the Crown Rheostat automatic cleaning machine shown in Fig. 4. This is a double-lane machine with thirteen tanks on a side, each tank of 267 gallons capacity. The double line makes possible the simultaneous processing of steel parts on one side and zinc parts on the other. In either case, the complete cycle for cleaning is just under eleven minutes. Parts remain in each tank for twenty seconds and spend thirty seconds in travel between each two tanks.

The zinc processing cycle is as follows:

1. Clean in direct current cleaner, Oakite No. 50, 4 oz./gal., 180 deg. F.
2. Clean in reverse current cleaner, Oakite No. 50, 4 oz./gal., 180 deg. F.
3. Hot water rinse, 120 deg. F.
4. Cold water spray rinse.
5. 2 per cent muriatic acid dip.
6. Cold running water rinse.
7. Cold water spray rinse.

8. Copper strike solution:
   copper cyanide 2½ oz./gal.
   sodium cyanide 3¾ oz./gal.
   sodium carbonate 2 oz./gal.
   anodes, equal numbers of copper and 18-8 stainless steel.
   temperature, 120-140 deg. F.
9. Hot water rinse, 120 deg. F.
10. Cold water spray rinse.
11. 1½ per cent (by volume) sulphuric acid dip.
12. Cold running water rinse.
13. Cold water spray rinse.

The processing cycle for steel differs from that for zinc in that tank No. 1 is charged with 2 oz./gal. of Oakite No. 50 operated with direct current. Tank No. 2 is a cold water rinse. The acid dip in tank No. 5 is 1½ per cent sulphuric acid instead of the muriatic acid used for zinc. Another view of the cleaning machine is shown in Fig. 5.

At the finish end of this cleaning machine is located the partially automatic Crown plating machine. This is a 3,000-gallon capacity reciprocating type machine charged with high speed copper solution. The cycle on this machine is set for eight minutes, after which the work is immersed in the dragout tank adjacent. The dragout tank has a capped overflow that permits fluid additions to the copper bath from the dragout as required.

The work is next rinsed in cold water and dipped in a rubber-lined acid tank containing 5 per cent sulphuric acid. Two cold water rinses complete the preparation for the nickel plating machine.

The nickel plating machine, illustrated in Fig. 7, is another Crown partially automatic of the reciprocating travel type. The machine has a capacity of 4,700 gallons, and is Koroseal lined. The Harshaw Bright Nickel solution is used, with rolled carbon 99 plus per

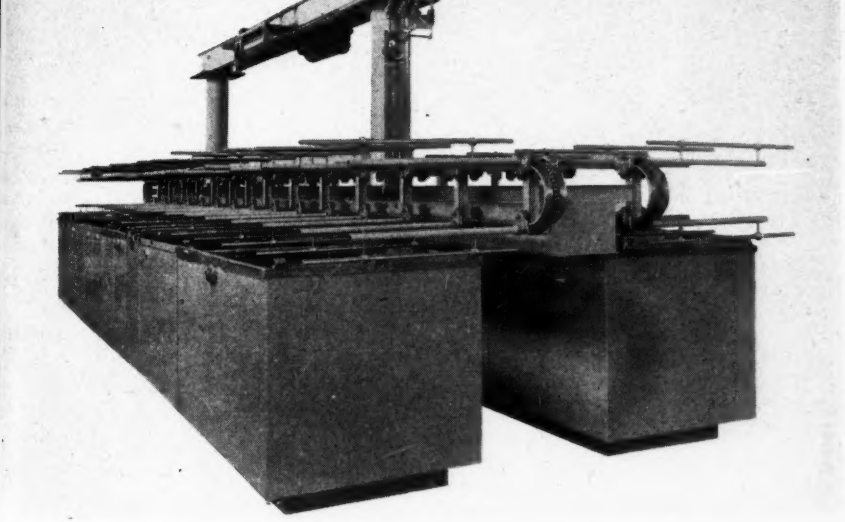


Fig. 5—A view of the 13-tank double-lane automatic cleaning machine in the lowered position (*Photo courtesy Crown Rheostat and Supply Co., Chicago 18, Ill.*)

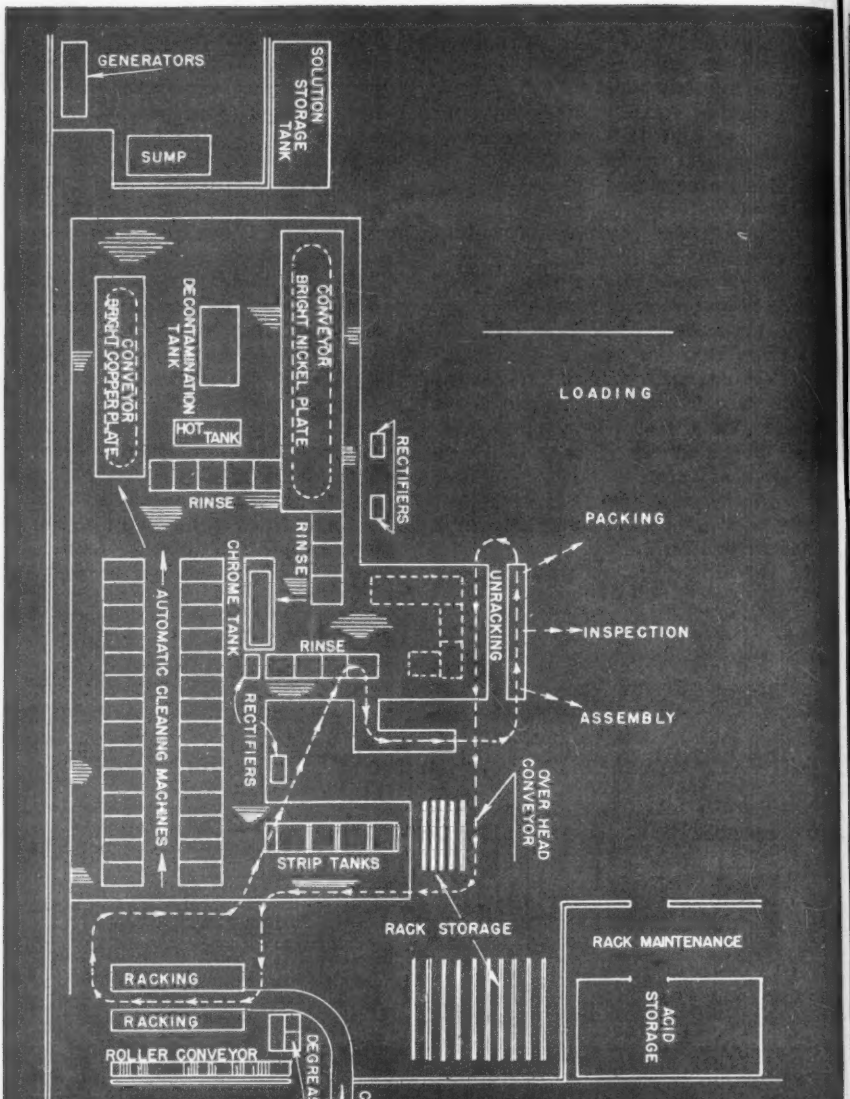


Fig. 6—Floor plan of the Cannon plating department

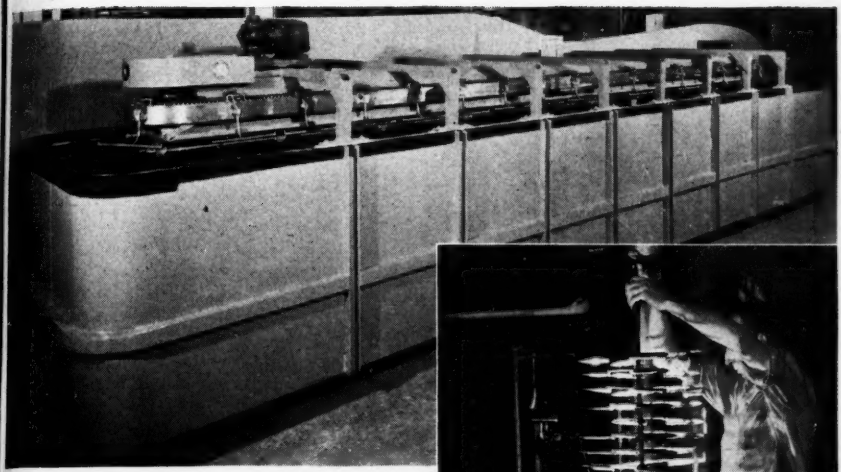


Fig. 7—(Above) A view of the partially automatic nickel plating machine prior to installation in the plant of the Cannon Electric Development Company
(Photo courtesy Crown Rheostat and Supply Co., Chicago 18, Ill.)

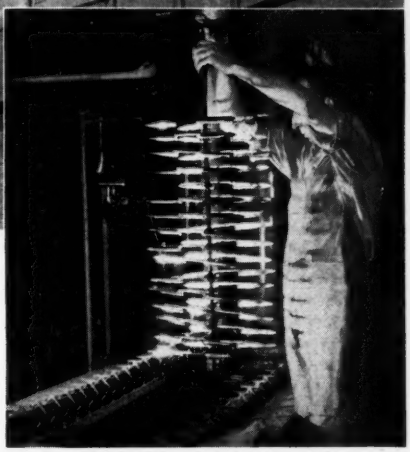


Fig. 8 — (Right) Illustration shows operator placing a rack load of parts in a chromium plating tank.

cent anodes. The processing cycle on this machine is 14 minutes. The nickel machine's dragout tank and rinses precede the standard manually operated chrome plating tank, illustrated in Fig. 8, in which a 53 oz./gal. chromic acid plating solution is used with 7 per cent antimony lead anodes.

After the plating is completed with the final chrome rinses, the loaded racks are hung on the traveling conveyor that carries the wet parts through a hot air blast for thorough drying. The hot air is generated by passing clean air over steam-heated pipes, a method of drying that delivers a spotless plated part. Still on the conveyor, the loaded racks travel to the Ford parts shipping department where each part is carefully unracked and individually wrapped and packaged for shipment.

The racks, however, stay on the conveyor and travel toward the racking table. Before that point is reached, they are taken from the conveyor and placed in stripping tanks; the first a chrome stripper and the second a nickel stripper. Rinsed after the nickel strip, the racks are hung on the conveyor again, to complete the journey to the head of the racking tables.

Steam from low pressure boilers, gas-fired with oil standby, furnishes heat for the various operations. The copper, nickel, and chrome installations are equipped with Sarco regulators. Eight-volt, 1,500-ampere rectifiers are used on every operation except copper for direct-current supply. A 3,000-ampere generator supplies current for copper plating. From the floor plan of the Cannon plating unit, it can be seen that careful planning combined with efficient mechanical processing

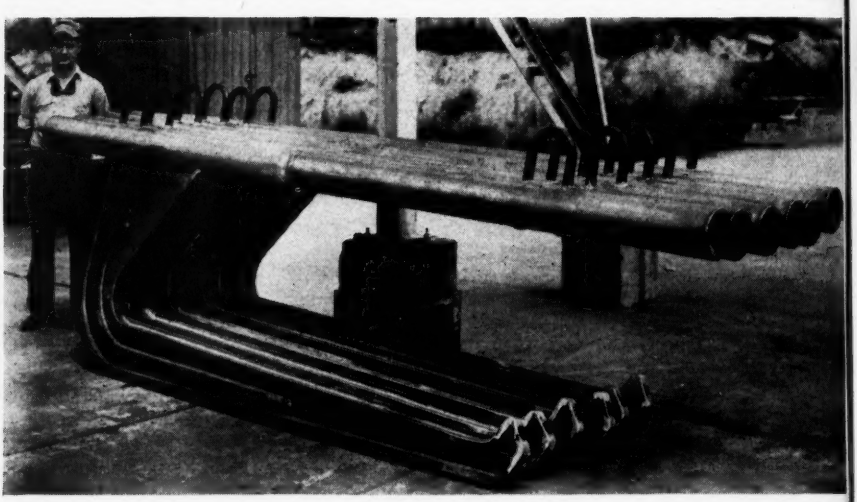
has made possible Cannon's efficient operation.

Engineered Purchase Specifications Aid Industry, Business, and Government

THE purchasing agent who wishes to make use of a scientific approach to his problems will find that his task has been greatly simplified by the National Bureau of Standards. Use of dependable specifications—the only logical way to achieve economy in purchasing—has been facilitated through the Bureau's compilation of all the standards and specifications in general use for commodities produced or purchased in this country. The result, a comprehensive reference book of unusual simplicity and clarity (the National Directory of Commodity Specifications), briefs, catalogs, and indexes the information needed in buying all types of products.

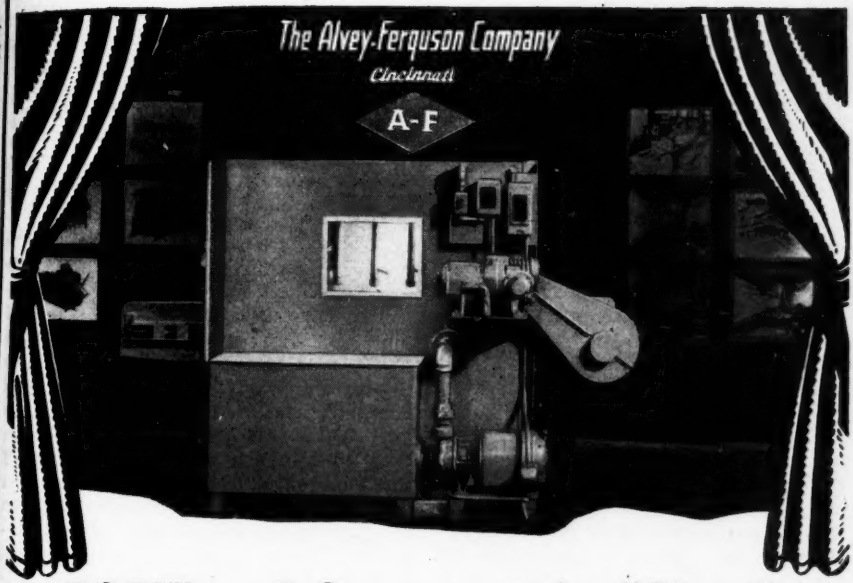
A specification is a concise, definite, and complete statement of what the buyer requires from the seller. It includes limiting values for the properties necessary to meet the required service, with proper tolerances.

Manufacturers are realizing more and more the importance of a careful selection of the material that goes into the finished product. Standardized methods of test based upon conditions met in service avoid friction between buyer and seller and are a necessary part of an adequate specification for a raw material or a manufactured article. The really essential qualities of a product cannot be determined from mere inspection. Laboratory research is necessary, and this sometimes involves months or even years of work. The method used in testing must like-



HEAVY DUTY PICKLING HOOKS. The six hairpin pickling hooks shown here, weighing 1,272 pounds each, are capable of carrying loads up to 4,200 pounds. Fabricated entirely by welding, the hooks themselves are made of heavy Monel plate. The round supporting members are of steel covered with a welded-on jacket of 14 gauge Monel. The hooks were designed and made by the Youngstown Welding and Engineering Co., Youngstown, Ohio, for the pickling of wire and cable.

(Photo courtesy The International Nickel Co., Inc., New York 5, N. Y.)



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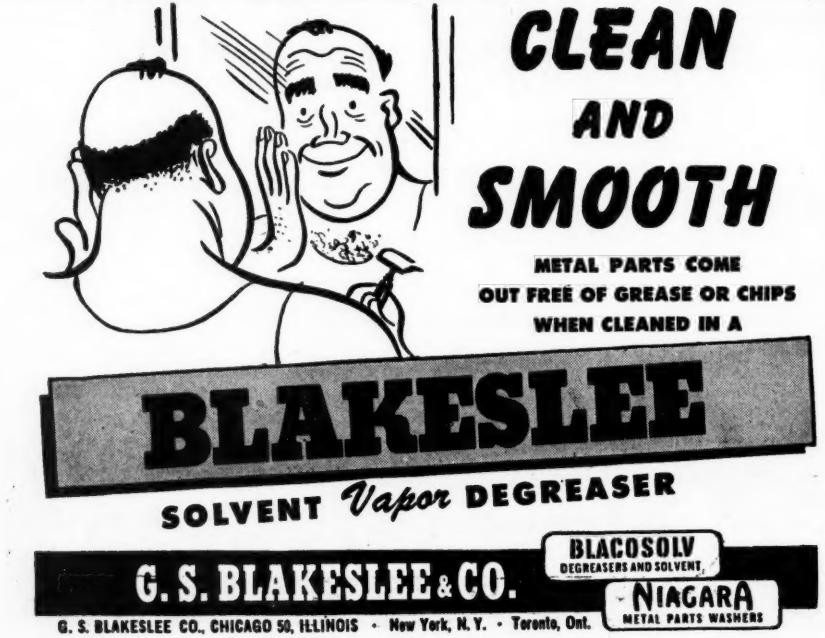
With the object of bringing about the widespread use of specifications for purchasing, and in order to provide a background for the development of better specifications, the Bureau undertook the compilation of a classified list of specifications which had been formulated not only by public purchasing agencies but also by non-governmental organizations having national recognition. The result was a guide for both specification writers and buyers of commodities—the National Directory of Commodity Specifications.

The 1945 revision of the Directory, consisting of 1,311 pages, was rapidly and widely distributed, but under post-war conditions additional information on new commodities was an obvious necessity. However, instead of issuing an entirely new volume, the National Bureau of Standards has placed all of the new information in a 322-page supplement.

The two volumes provide a complete listing by name, designating number, and issuing or sponsoring organization of all the standards, specifications, and methods of test in general use in this country. Included are the voluntary "Simplified Practice Recommendations" and the voluntary "Commercial Standards" which have been developed by industry under the cooperative procedure of the National Bureau of Standards.



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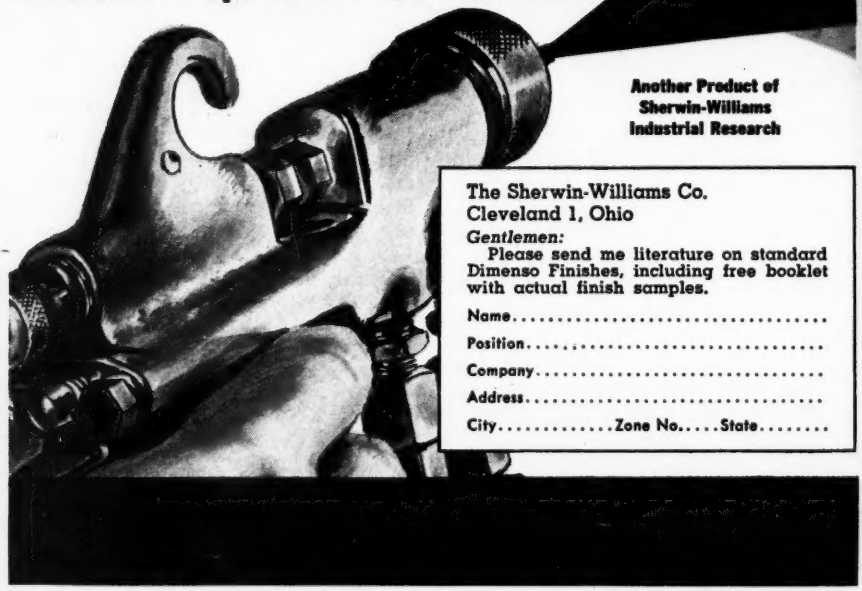

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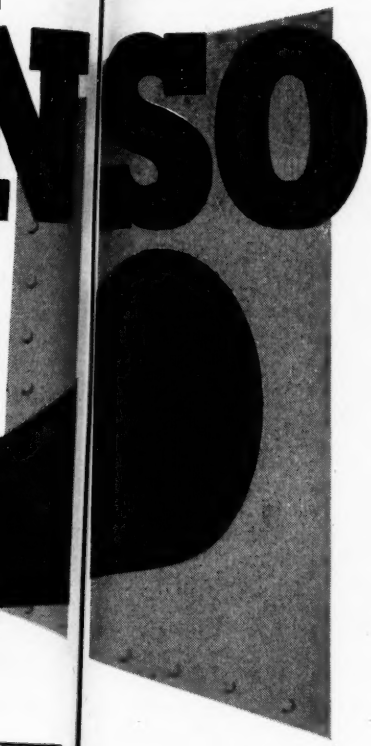

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Electro-Spray Finishing of TACKLE BOXES

By C. M. LONG

General Manager, Metalware Division
Stratton and Terstegge Co., Louisville, Ky.

IN the Metalware Division of the Stratton and Terstegge Company, fishing tackle boxes are being produced with increased efficiency as a result of the installation of a Ransburg electrostatic spray unit. The "electro-spray" unit is installed so that this operation may be successfully combined with hand spray to obtain maximum finishing efficiency.

On many of the boxes, which are sold nationwide under the brand names of "My Buddy" and "Falls City," a combination of wrinkle enamels are used on the exterior of the boxes for the durable scuff-proof service required, and glossy synthetic enamels are used on the inside of the boxes, including the compartmented bait trays.

Straight line flow through the finishing department is accomplished by first preparing the parts for paint in an automatic washer. The parts move down a slide from the washer to a loader who stacks the compartmented trays ready for handspray and hangs the boxes in an open position on the overhead monorail conveyor. The tray compartments are transferred a few feet to the hand touch-up area where they are sprayed by hand.

The boxes are carried on the conveyor through a spray booth where the interiors are coated. The operator then closes each box on the hanger to position it properly for the electrostatic spray which follows immediately. The conveyor line enters the electrostatic booth on the right side at the far back, turns 90 degrees, and leaves at the face of the booth where the automatic guns are stationed, thus permitting the operator to inspect the painted work as it moves toward the baking oven. A friction bar engages the skate-wheel rotors on the conveyor pendants and turns the work slowly as it passes through the electrostatic spray zone.

Only three fixed automatic guns are used in this operation, but not all three operate at the same pressures. The top gun on the right hand side of the conveyor line and the bottom gun on the left side are adjusted for 5 pounds fluid pressure and 20 pounds atomizing pressure when wrinkle paint is being applied. The right hand bottom gun is operated at 2 pounds fluid pres-

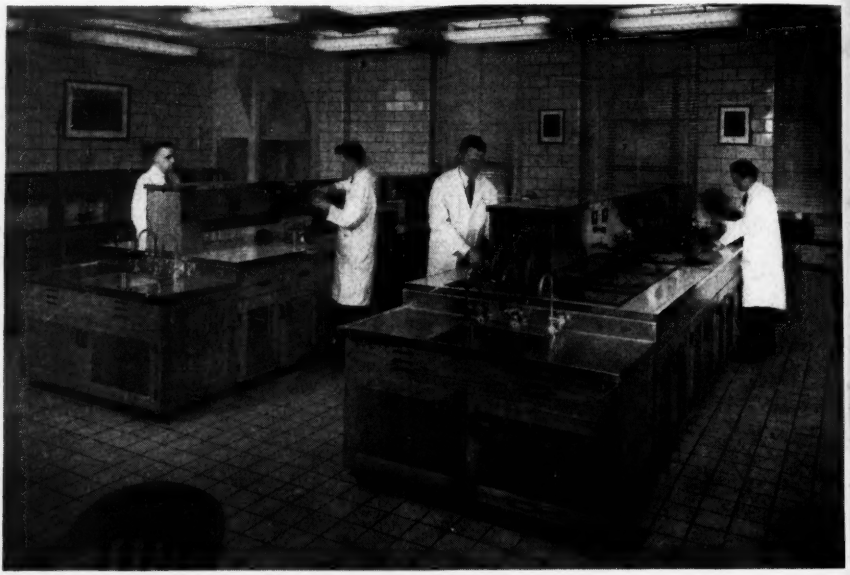
ration shows a view of the spray booth in which fishing tackle boxes are spray painted automatically in an rostatic field. The operator need only check air and fluid pressure periodically to ensure efficient operation.
(Photo courtesy Ransburg Electro-Coating Co., Indianapolis 7, Ind.)

sure. When synthetic enamel is used on the exterior of the box, the pressures are cut to 1½ pounds on fluid and 12 pounds on atomizing air.

Under usual conditions viscosity of the wrinkle material is held to 30 seconds on a Ford No. 4 cup, and the gloss enamels are reduced to a viscosity of 15 seconds. These reductions are somewhat lower than the hand spray materials and are necessary in order to accomplish better atomization of the paint at low pressure without excessive forward velocity. Thus, the electrostatic field can perform its function of attracting the paint to the boxes with its characteristic high uniformity and efficiency.

From the electrostatic booth parts are carried upward on the same conveyor to a gas-fired oven suspended from the ceiling, where they are baked for 16 minutes at 325 degrees Fahrenheit. Returning from the baking oven to a point adjacent to the Ransburg booth, the parts are unloaded by final assemblers onto a table-top type conveyor, where name plates, hinges, trays, and boxes are assembled into finished units. The entire finishing cycle requires only 25 minutes, 16 of which are expended while parts are in the oven.

The efficiency of this system can be gauged not only by the appreciable paint and time saving, but also by the fact that more than two or three rejects in a day's run is very unusual.



SPOTLESS ELECTROPLATING LABORATORY—A new electroplating laboratory at the Westinghouse Electric Corporation features the neatness and efficiency of a well-designed, modern electric kitchen. The lab—used to develop better electroplating processes for nickel, copper, chrome, silver, gold, and other metals—features acid-resisting tile walls and floor, sound-proofed ceiling, tempered Carrara glass table tops, and completely concealed plumbing. In addition to the chemical lab shown here, the laboratory also includes an office and meeting room, workshop, storage rooms, and a pilot line production room. New electroplating processes leaving the laboratory are ready for initial application in commercial production.
(Photo courtesy Westinghouse Electric Corp., Pittsburgh, Pa.)

★ BAKING

(1) Prime and finish coats of paint. (2) Insulation on electrical windings.

★ DRYING

(1) Metal products after baths. (2) Special coats on metal, wood, paper, fabrics and plastics. (3) Wet electrical equipment.

★ DEHYDRATING

(1) Textile — Yarn as well as woven fabrics. (2) Paper.

★ DEGREASING

(1) Metal Products.

★ PREHEATING

(1) Metal products to secure shrink fit. (2) Fibre, metal to make shearing and punching easier. (3) Glass closures prior to filling to prevent breakage. (4) Syrups, grease, oil, paint in containers to speed flow. (5) Plastics prior to forming. (6) Metal prior to welding.

★ MISCELLANEOUS

(1) Soldering. (2) Cooking food. (3) Carbonizing woolen materials. (4) Comfort heating. (5) Sanforizing.

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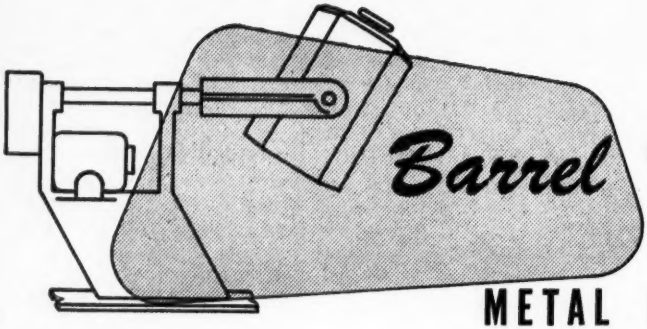

Barrel Finishing of METAL PRODUCTS

Part 26—Barrel Finishing and Its Relation to the Stability of Electrodeposited Surfaces

By H. LEROY BEAVER
Barrel Finishing Consultant
Lansdale, Pennsylvania

A CONTEMPORARY publication has recently commented editorially on some customer or user complaints of the lack of stability of present-day surfaces. Speaking for barrel finishing, we would add our comment with the feeling that it is of considerable pertinence to the main question.

If anyone thinks that employers of platers, platers themselves, or buyers of plated materials do not carefully read the trade publications devoted to the spreading of information relative to metal finishing, then they should have been on the receiving end of this research with me. The questions, if they were to be reduced to a composite one, might well sound something like this, "Well, you have been dwelling so long on the stability of plated surfaces that have been barrel burnished, what have you to say to this?"

We have already written much that is pertinent to the subject of the stability of plated surfaces, and we will now try to add to what we have already written in the hope that the subject matter will lend some clarity to the problem of plating failure.

At the bottom of the whole problem we are certain is a thing that can be easily expressed and in one word. You may blame a porous condition on any number of factors, such as improper solutions, improper preparation of the parts prior to plating, but we have yet to hear anyone anywhere attribute porosity of surface finishes to any barrel finishing operation.

Plated surfaces are porous, the degree of porosity varying with the factors of surface and plating conditions. Dr. C. F. Kettering of General Motors and Dr. William Blum of the United States Bureau of Standards have emphasized the fact. Dr. Kettering has stated, "The same thing that causes painted surfaces to fail and plated surfaces to fail is porosity." Neither of them so far as we have followed their pronouncements has ever suggested a remedy for the condition. We know from our own experience that porous

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QUESTION: How do infra-red lamps work?

ANSWER: General Electric industrial infra-red lamps produce heat quickly, cleanly, economically. Heat is generated *within* the material being processed.

QUESTION: For what purposes is infra-red used?

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QUESTION: Is infra-red equipment costly?

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QUESTION: Can ovens be adapted to suit special needs?

ANSWER: Yes. Equipment is compact, movable—easily arranged to suit large or small production line operations. General Electric lamps are available in various types and wattages to give exactly the right amount of heat.

QUESTION: Can employes operate infra-red ovens in comfort?

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QUESTION: Where can you get full information?

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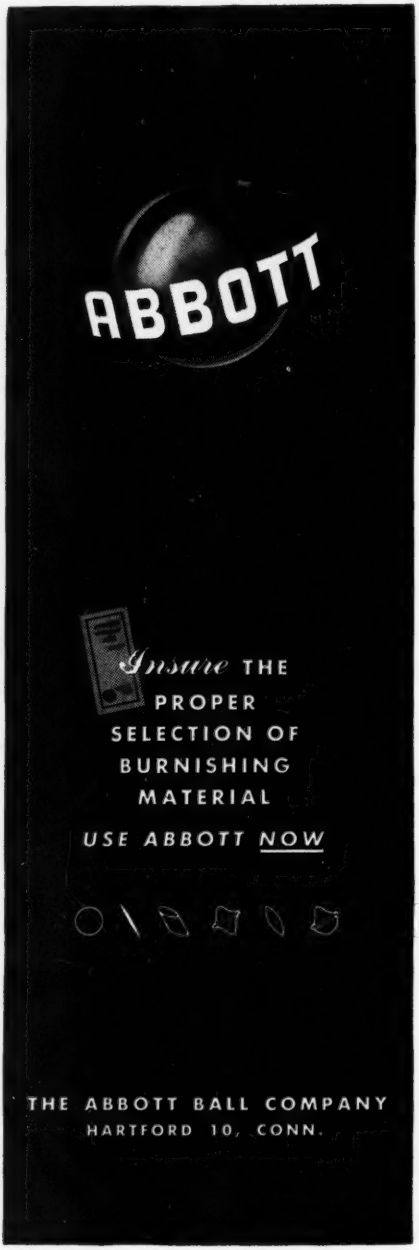


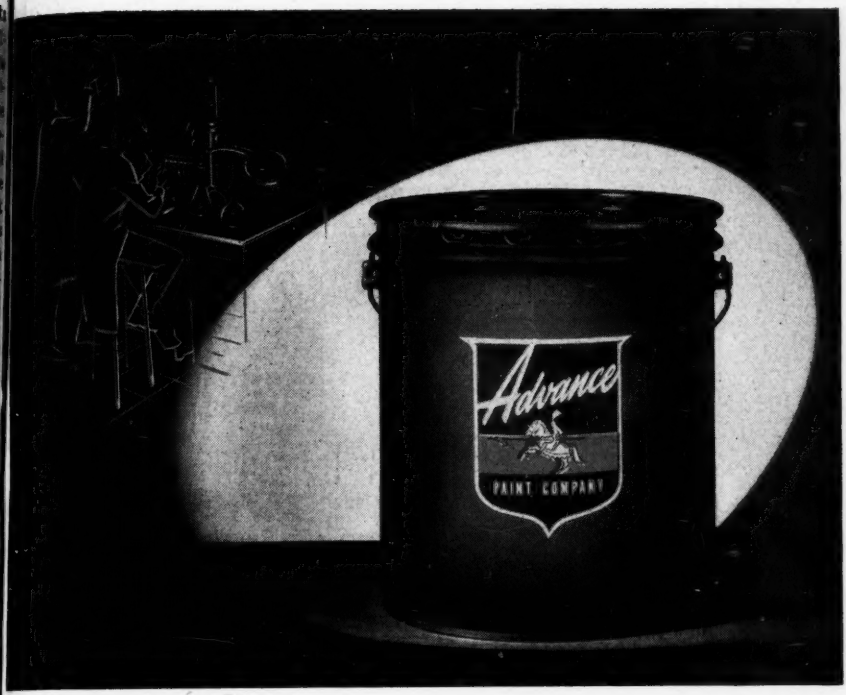
surfaces do exist. We have taken parts where magnification has shown definite porosity and then examined the same parts after they were appropriately barrel finished and found the porous condition to have been removed. We do not say that all plated surfaces are porous to exactly the same degree for this is not true, but porosity does and perhaps always has existed and will always be present in any plated surface. It can only be removed by some treatment subsequent to the actual plating operation.

Those of you who have followed this series of discussions will of course recall the benefits to be derived from barrel finishing for we have stated them many times, and now some of them seem to bear repeating:

1. By pressure developed within the burnishing mass to work harden the plated surface, condensing the surface to close porous areas to provide for resistance to corrosion and
2. By pressure developed within the burnishing mass to harden the plated surface for resistance to wear, and
3. Least important, the securing of brilliantly burnished surfaces for "over the counter" sales appearance and beauty appeal.

Now, if the first two and most important objectives are attained, then the third will follow whether we wish it or not.

But have you noted that in all of these discussions of the value to be derived from barrel finishing procedure that we have been pretty profligate in the use of just one word, and that word is "adequate"? We have a lot of barrel finishing operations carried on in a wide variety of styles and shapes of barrels and under the same wide variety of barrel loadings as respects the weight of the barrel finishing mass. When we speak of an adequate barrel finishing operation the mean-



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ing we want to express is that the barrel and its load shall be such that the pressures developed in its operation will adequately vary the degree of plasticity of the plated surface and iron it out, so to speak, or condense it, so that all pores will be closed and the surface properly work hardened. To do this requires considerable pressure, and not all electrodeposited metals are of the same hardness, so that a load appropriate for one metal might be too light for other metals and this is why we always suggest high pressure barrels with heavy loads and with slow operation as against light pressure barrels with light loads and high speeds. Remember in barrel finishing we are not trying to simulate a runaway horse, but rather an operation of a heavy draft horse pulling his load quietly and stolidly and while not r e a c h i n g the objective at literally breakneck speed, he accomplishes the job in a completely satisfactory way.

Suppose that we illustrate a pore in a plated surface as being just as large as a quarter dollar. Now if we operate this plated part in a low pressure barrel and reduce the size of the pore to the proportion of a dime, what profit is there in that? It will still be a pore, only smaller in size. But a like part operated in a heavy pressure barrel will be affected to cause the pore to disappear completely. That is simple enough, isn't it? You would be surprised how few people realize this simple fact and yet you can easily prove it for yourself. Barrel finish identical parts in both high and low pressure barrels and then expose them to the commonly accepted three tests, urban, rural and marine. Or, take one part just as it comes from the plating barrel, one more low pressure burnished and a third high pressure burnished, then set them up to exposure, one group in each of the following locations: center of city, typical country

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farming area, and seashore exposure. You will find that the part just as it comes from the plating barrel and the low pressure burnished part will show positive to corrosion while the heavy pressure part will invariably show negative to corrosion.

Now what about the salt spray test or the salt mist test or whatever term you want to apply to the process? Why do you use it if not to determine the degree of porosity of the surface under examination? Many people condemn the process but as far as we are concerned we are all for it because if it proves anything, it will prove that parts adequately barrel finished will show negative to the test and parts not so finished will show positive.

Now comes another factor. How many times have we been told, "We don't need barrel burnishing because all of our solutions plate out bright." Is that so, and even though they do plate out bright as you say, what about porosity. Whether the plate is deposited bright or dull, and even though bright plated surfaces do not require barrel burnishing for final finish, what about the elimination of porosity and the hardening for resistance to wear? There is the further argument that, if you use bright plating solutions you need not deposit as heavy a thickness of plate for you do not have to provide additional thickness to take care of losses of surface thickness due to buffing.

It has been quite some time ago since our very good friend Mr. George B. Hogaboom contributed a discussion of the application of gold plate, and the tenor of his comment was that in all too many instances, the thing that was called "gold plate" was not a plate at all but simply such a thin film of gold that it could only be regarded as a "color." Gold color is after all not gold plate as that term is generally understood, and here too we would have the same old matter of porosity. Could it be possible that much of the later day complaints about the lack of stability of plated surfaces stems from the fact that too many people are using a bright plate more to color the underlying basis material than to provide for resistance to corrosion and wear? Be that as it may, the fact remains that porosity is at the very bottom of just about every plating failure, and whether you are depositing your plating bright or dull and even though the plate is as thin as gossamer, an appropriate barrel finishing operation will flatten it out even thinner than you have deposited it, and you at least will get a more even chance to have your product stand up under service.

What Mr. Hogaboom had in mind in describing gold plate as a color rather than a plate was in connection with cheap jewelry. Just about all of this class of production is low pressure barrel finished in what we always

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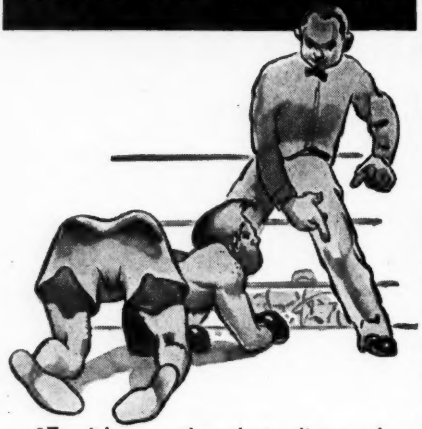

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have termed "play toy" types of bar rels, just little wood tubs where the is a woeful lack of pressure, but whe a bright finish is superficially rubbe on and later "protected" by a coat lacquer. Ever attend rummage sales Try it sometime, and you will like find that you can accumulate for very low cost close to a coal scutt full of jewelry and other gadgets the household type that have fail and been thrown into the discar Sometimes we are given to wonderin just how many manufacturers ha literally plated themselves out of bu iness simply because they refused recognize that stability as well beauty were both requisites to a well conceived production and distr bution plan.

And then we have another fact that might well contribute somethin to the lack of stability of plated su faces, and this one we can lay righ down on barrel finishing's front st

Several years ago we were delvi into the difference between polishin and by that we mean both cut a and color operations as done wit wheels and buffs as distinguishe from the removal of surface area b barrel finishing methods using abra ives. At that time we had a lett from Mr. William Phillips, Hea Electrochemical Laboratories, Gener Motors Corporation, in which M Phillips, as we recall it said, that in series of tests conducted by his de partment it was determined that, "A forms of polishing were detrimental t the protective value of subsequent lay ers of electrodeposited metal su face." This position was later concu red in by no less than Dr. Arthu Hothersall of the British Electrod positors Technical Society, during th Asbury Park Convention of the Am erican Electroplaters' Society.

In our production we have what termed "re-rolled" steel strip, a might be best illustrated by the fin

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products turned out by Greer Steel Company and Newman-Crosby, where normally rolled strip material is passed through highly polished rollers where the surface skin is made more smooth and of greater density so as to provide for finer plated finishes. We have always been taught that the least interference with this re-rolled surface skin, the finer and more stable will be the subsequent plated surface. Quite naturally when a metal surface is subjected to pressure the surface is work hardened and many inequalities are literally ironed out. Even though there might have been some degree of porosity in the original strip material, much if not all of it is rolled out in the work hardening or re-rolling process. Maybe that is why household utensils such as electric irons, waffle irons and such, the shells of which are invariably made from re-rolled stock, stand up so well in actual service, and these shells, so far as our experience goes, are not barrel burnished. But what can we say of other stampings made from this same re-rolled material, or any stampings made from strip material, that are later tossed into a barrel with fractured minerals and churned about until the original surface skin is completely removed? Do we or do we not uncover pores that were closed in the rolling process by such a destruction of the original surface skin, and if "yes," just to what extent do those pores effect the stability of subsequent layers of electrodeposited surface?

Please try to understand that we do not condemn the use of fractured minerals in any form or of any adequate material so long as they are used in their proper place. That proper place it seems to us is literally confined to their use on castings and forgings of either steel or iron as well as the non-ferrous metals. It has been amply and adequately shown that burrs and wire

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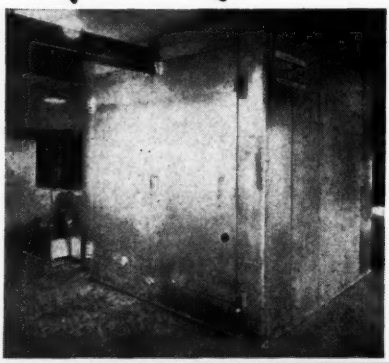

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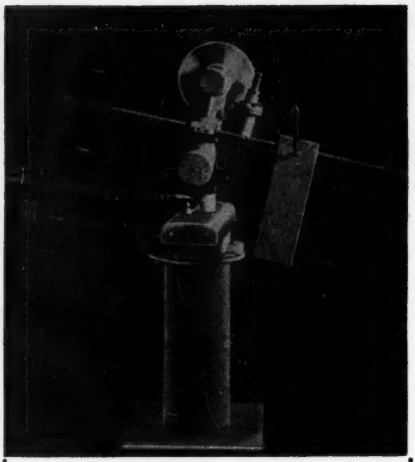

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edges can be removed from the edges of stampings where the surface skin must be maintained by simply operating them in barrels with dead soft annealed steel barrel finishing materials and without the use of abrasives of any character. The soft steel materials will bite into and remove burrs, and the rolled surface skin will have the very least of interference.

Indeed, fractured mineral or abrasive barrel finishing properly applied has a very important place in the metal finishing scheme of things because it literally performs the "pick and shovel" part of many operations and at a much lower unit cost, but it is simply submitted that the laborer who digs the outside ditch is seldom assigned the job of installing the chrome plated bathroom fixtures.

We have tried ever so many times to arrive at some working arrangement whereby the electro-chemical and the mechanical factors of the surface treatment of metals could be considered together, particularly with regard to operations on parts subsequent to plating. The principal cause of failure of electroplated surfaces is porosity and if the problem of porosity cannot be solved by electro-chemical procedure, then perhaps some progress will be made if more intelligent application is made of the proven methods of barrel finishing procedure already developed.

Paul G. Exline, consulting instrument engineer of Tulsa, Oklahoma and retiring president of the Instrument Society of America, asserts: "Out of every dollar now being spent by processing industries on construction of new plants, 20 cents goes for the purchase and installation of instruments." He estimates that in 1939 only five cents of each dollar spent on new plants went into instruments to be used in plant operation.

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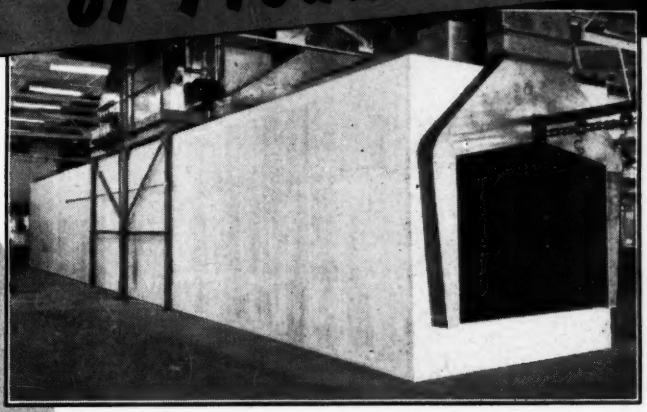

Photo shows indirect steam blast coil air-circulated body oven producing rapid drying. Note high-pressure air seals at both ends of oven.

The accompanying pictures are part of the Complete Finishing System for bodies, fenders, hoods, frames, wheels and miscellaneous parts located at the newly opened Lincoln-Mercury Division plant at St. Louis, Mo.

The design of all finishing equipment was coordinated with the purchaser's engineers to produce a new departmentalized theory of automobile production.

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Finishing Washer Tubs and Machines

By R. A. MOORE
The Sherwin-Williams Company

THE shortage of enameling steel for porcelain enameled tubs used by washing machine manufacturers made necessary the substitution of aluminum as the tub material in some cases. This change alleviated the metal problem to a degree, but it created a new problem of securing an organic finish which would withstand the effects of the alkali and abrasion encountered on the interior of washer tubs. This problem has been solved in one case by the adoption of a new finish known as Superclad, developed for use on washing machines.

One large washer manufacturer is in full production on several hundred machines each day which are completely coated with Superclad on the exterior as well as on the inside and outside of the aluminum tub used to replace the porcelain steel tub formerly used. The coating produces an attractive appearance on the machine due to the high gloss and great depth of film which is characteristic of the new finish.

The new finish did not require any major change in the processing setup formerly used in finishing washers with the standard synthetic type material. In fact, it was only necessary to change the solution in the Bonderizing tank to make possible the finishing of tubs on the same line as the other machine parts.

As in all finishing operations, cleaning and treatment of the metal surface is of the utmost importance. Prior to the adoption of the new finish, this particular production system consisted of the normal cleaning, Bonderizing, applying a synthetic enamel by mist and full coat, and baking in a convection oven. A six-stage setup was employed for metal cleaning and treatment. The metals passing through this system were as follows: steel, gray iron castings, zinc die castings, and zinc plated steel.

The stages through which these metals passed were as follows:

1st tank—Emulsion cleaner.
2nd tank—Mild emulsion cleaner
3rd tank—Hot water rinse
4th tank—Spray Bonderite
5th tank—Water rinse, room temperature
6th tank—Chromic phosphoric acid rinse

In all cases the solutions were applied by jet spray. On leaving the final rinse, the work was blown off and dried in a chamber maintained at 300 deg. F., cooled, and moved into the

spray booth. The mist coat was applied using a circulating system with normal spray equipment. The finish or full coat followed in two minutes. Five to seven minutes later the work entered the oven for a bake of 23 minutes at a maximum temperature of 315 deg. Fahrenheit.

When the new type finish was made a part of the system, most of the changes necessary resulted from the addition of another metal—aluminum. Thus, the six-stage pre-paint setup is now as follows:

1st tank—Parker 101 and 301 water conditioner
Sodium orthosilicate (Orthoside) as needed
Temperature, 150 deg. F.

2nd tank—Hot water rinse, overflowing

3rd tank—Bonderite No. 34
8 per cent accelerator
Temperature, 155 deg. F.
(This tank is used on machines)

4th tank—Bonderite No. 170
Temperature, 140-145 deg. F.
(This tank is used on tubs)

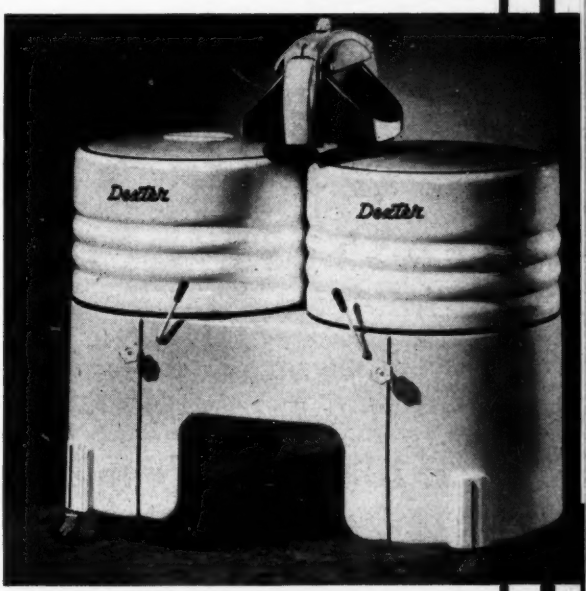
5th tank—Cold water rinse, overflowing

6th tank—Chromic acid rinse, 0.04 oz./gal.

To maintain production, all tubs are cleaned, treated, finished and baked on the second shift. During this period tank No. 4 is in use and tank No. 3 is idle. During the time when machines are being finished, tank No. 3 is in operation and tank No. 4 is not used.

All water is blown off between the chromic acid rinse and the dry-off oven. The oven is held at 300 deg. Fahrenheit.

Prior to the priming operation, the primer is reduced 33⅓ per cent with reducer to 25-30 seconds on a No. 4 Ford cup at 75 deg. F. It is supplied to the first section of the spray booth by the circulating system at 18 pounds fluid pressure and applied to the washers and tubs



at 70 pounds air pressure on the Model 19 Binks gun, using fluid nozzle 63-C, air nozzle 63-PB, and needle valve 16. A full wet coat of primer is applied, with the gun held close enough to the work to prevent the formation of any dry spray. The time available between the application of the primer and the enamel is two to three minutes, although this interval can be shortened.

The enamel is reduced 33⅓ per cent with reducer to a viscosity of 25-30 seconds on a No. 4 Ford cup at 75 deg. F. and supplied to the second section of the spray booth by the circulating system at a pressure of 21 pounds. It is applied to the work with the same type Binks equipment as that used for the primer, using 70 pounds of air on the gun. Again a full coat is applied.

Following the application of the enamel, the washers are monobaked 26 minutes at 290-300 deg. F. in a gas-fired convection oven. The tubs are normally baked 26 minutes at 320 deg. F. to ensure maximum alkali resistance of the finish on the interior of the tubs. (The primer and enamel can be baked separately if the setup in which these materials are to be used is such as to warrant this type curing.)

Although the example of washer production cited here has considered various metals, the discussion has been limited to the use of a phosphate pre-paint treatment on the metal. In the case of aluminum equally satisfactory results can be obtained over anodized and Alodized aluminum. Satisfactory results can be obtained over bare aluminum which has been properly cleaned, although the adhesion is not as good as that experienced on treated parts.

Washer manufacturers, plagued by the shortage of enameling steel, have thus been provided with an organic finish for aluminum tubs, which, although it is not a cure-all, will satisfy their requirements.

NON-INFLAMMABLE

ELECTRO

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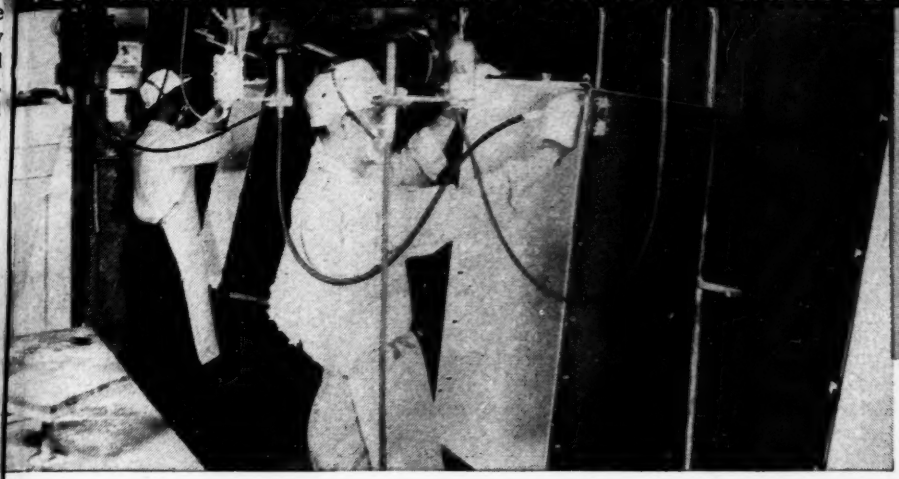

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MAHON

Finishing Clinic

Recent Engineering Developments in Piping and Heating Plating Baths

By DR. ALLEN G. GRAY

•

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

•

THE growth and expansion of the electroplating industry has resulted in the constant development of improved methods for handling solutions in the plating room. Piping a plating plant may involve steam fitting, plumbing, lead burning, welding, and above all, the finest type of engineering. This was the impression given platers attending the 1948 Northeastern Regional Meeting of the American Electroplaters' Society at Rochester, New York, by W. E. Stadel, George L. Nankervis Company, in presenting a paper prepared by Mr. Nankervis. A few of the recent demands placed upon piping requirements are proper air agitation, automatic spraying, precise temperature control, proper reclamation of rinses, and in many instances, the deionization of water.

Rinsing

Considerable stress must be placed on the availability of adequate water for specific rinsing problems and tank makeup, according to information presented by Stadel; however, by the same token, consideration must be given to the economy of water use. Thus, it is generally considered that the best way to introduce water into rinse tanks is to introduce this water into the bottom of the tank. It has been found that much smaller quantities of water are necessary to maintain a clean solution if this plan is followed. In the case of water rinsing on full automatic equipment, it is generally advisable to use intermittently operated sprays which are operated by remote control so as to

THIS MONTH . . . Recent Engineering Developments in Piping and Heating Plating Baths . . . Methods and Equipment for Baking Organic Coatings . . . Some Effects of Surface Active Agents in Metal Cleaning . . . Proper Spray Gun Technique Essential for Economical Finishing

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function only when the rack is being lifted out of the rinse tank.

Piping

A good piping layout for the plating room must be very flexible and as simple as possible. When metallic pipes are used on electrified tanks, a dielectric insulation must be employed, of which there are several types available. In small size metal pipes it is necessary to select a good insulating joint. However, according to Stadel, when pipes are large, flanged connections are generally employed using rubber gaskets with Bakelite bushings and Bakelite washers. Where large pipes are used it is important to employ expansion joints, particularly when the solution transferred has a temperature range variation.

There have been developments in pipes and valves suitable for use in the plating room during the past few years. These developments have included resistant plastic and plastic composition lined pipe, as well as rubber-lined steel pipe. Another type of pipe and fitting resistant under most conditions encountered in the plating room is silicon alloy material.

Valves

In designing the piping installation of a plant, valves are a very important point of consideration. It was reported by Stadel that the diaphragm type of valve is available for all types of solutions and has certain advantages which may be enumerated as follows: (1) it is an excellent valve for on or off control; (2) the maintenance is low; (3) the cost is reasonable. However, the valve was reported to be not too suitable for precise throttling. Concerning corrosion resistant requirements, it was reported that this type of valve may be secured rubber-lined with a steel body, silicon alloy body, or composition formaldehyde

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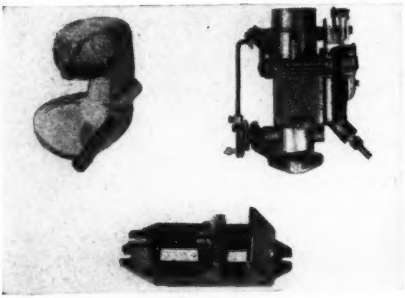

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and asbestos body, all flanged for connections.

According to Stadel, for some installations the globe type of valve may warrant consideration. It was reported that this valve is good for most all types of solutions and the cost, although probably slightly higher than diaphragm valves, may not be too great a consideration. Other types of valves are available in either gate or globe type, constructed of stainless steel, Monel, brass or iron.

Heating

In connection with piping, one of the engineering problems which should be considered is the heating of solutions. The most generally accepted type of economical heating for the plating room is that employing coils or heat exchangers.

In figuring the amount of heat necessary to properly raise the temperature of the various heating solutions, and to maintain them at proper temperature in the plating room, the following factors should be considered: (1) heat-up time allowed; (2) size and construction of the tank for heat loss to the atmosphere; (3) method of heating tank solution (steam coils or heat exchangers). It was pointed out by Stadel that in all cases it is inadvisable to run steam condensate from any heated solution in the plating department which contains chemicals harmful to boiler feed water back to the steam source. Such practice is hazardous because any break in the line or in the heat exchanger is very likely to allow harmful solutions to return to the power source and to severely damage the boiler.

In selecting a heating unit a survey of plant facilities will usually determine whether steam, gas, electricity or oil will provide the most reliable service on a year-round basis. The proximity of each to the proposed installation and the capacity of the gen-

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erating unit should be made. The temperature to be attained and the range of operation should be determined.

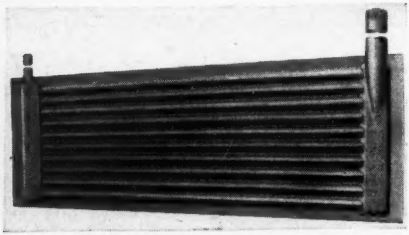

Fig. 1—The Platecoil tank heater, designed as a heat source without protruding coils (*Photo courtesy Kold-Hold Manufacturing Co., Lansing, Mich.*)

The amount of heat to be supplied is estimated in terms of heating units, usually in terms of B.T.U.'s (British Thermal Units). This figure will be the sum of all factors of heat requirement. The number of heat units required relates directly to the area of heating surface to be supplied. A practical chart, which is valuable for determining size of coils, has been prepared by the Heil Process Equipment Corporation, Cleveland 11, Ohio. This chart is applicable to open top dipping tanks, and provides data on the number of feet of pipe in either ¾-inch or 1-inch diameter required to heat 100 gal. of solution to any desired temperature, using steam at either 10 or 30 pounds per square inch.

Types of Coils

Indirect heating by means of steam coils is a very simple method of heat transfer. However, it is important that the materials of which the coils are made be suitable to withstand the corrosive attack to which they are exposed, submerged in the liquid bath or in an atmosphere directly above the bath. Heating coils are made to suit the tank operating limits. For dipping tanks, the coils are usually made flat and arranged in a frame that can be hung on the tank wall out of the way, easily removable. Where smaller heating surfaces are satisfactory, the candle-type or bayonet type of heater may be used. Fig. 1 shows a tank heater made by forming flat sheets into a coil.

Various types of exchangers are available for heating plating solutions. In discussing heat exchangers Stadel stated that there are three generally accepted types: (1) the carbon construction type; (2) the iron type, and (3) the silicon alloy type. The iron type is generally considered applicable only to alkaline type solutions.

Shown in Fig. 2 is a heat exchanger of carbon construction typical of the type used for heating bright nickel plating solutions. In this heat exchanger the outer shell and head construction are of welded steel and the liquor to be heated passes through impervious non-metallic carbon tubes. These tubes do not contaminate the bath and are unaffected by most chemicals. As can be noted from the illustration, the body of the exchanger is well insulated

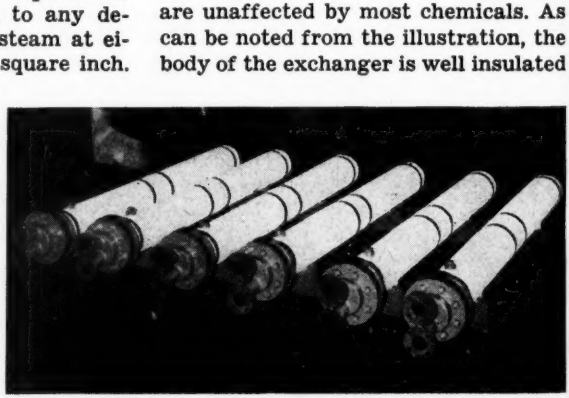

Fig. 2—Heat exchangers of carbon construction typical of the type used for heating bright nickel solutions (*Photo courtesy Heil Process Equipment Corp., Cleveland 11, Ohio*)

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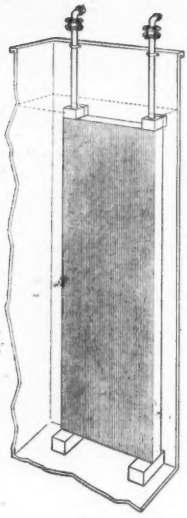

Fig. 3—Plate type heat exchanger of carbon ("Karbate") construction for use in plating solutions
(Photo courtesy National Carbon Co., New York 17, N. Y.)

against heat losses. Shown in Fig. 3 is a carbon construction ("Karbate") plate type heat exchanger manufactured by the National Carbon Company. These exchangers derive their names from the plate type elements used in their construction. The blocks or plates are provided with tubular channels for the passage of the heating or cooling medium. The outer surface of the plate is corrugated to attain maximum heat transfer area. Another type of impervious graphite heat exchanger is shown in Fig. 4.

Gas Heating

According to engineers of the Heil Process Equipment Corporation, there are situations where gas heating methods for plating solutions deserve consideration. Gas heating is advisable in instances: (1) when summer operation of a large steam boiler is costly; (2) if the tanks to be used are relatively isolated; (3) if heat is to be maintained at off-hours; (4) when a few tanks are to be operated. Two types of gas heating are generally used; namely the underfired type and the immersed flue type.

The underfired type has been described as the simplest form for gas heating. The burners are located directly under the tank. By jacketing the walls of the tank and allowing the hot gases to travel up the enclosed space surrounding the tank, the fumes can be readily exhausted. Underfiring can be applied to the water jacket surrounding chemical resistant vessels, making possible the use of acid-resisting material.

The immersed flue type of gas heating is adaptable to tanks that are lined with lead, rubber, or plastic, and to wood tanks. Gas firing takes place

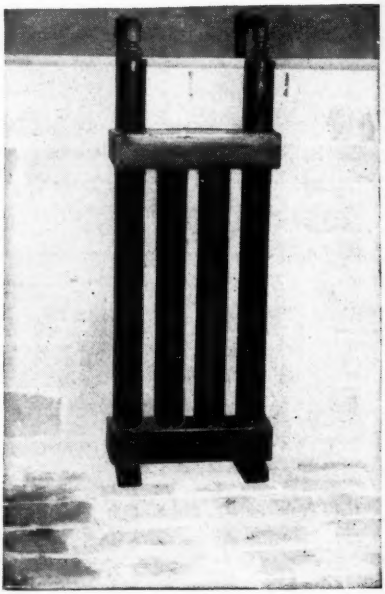

Fig. 4—The graphite heat exchanger here illustrated, called the Nocordal Grid Heat Exchanger, features a tubular construction.
(Photo courtesy Heil Process Equipment Corp., Cleveland 11, Ohio)

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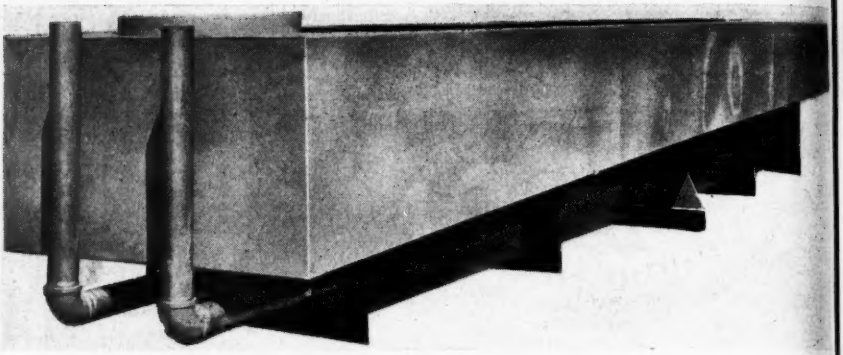

Fig. 5—An immersion gas heated water jacket chromium plating tank having the lead lining supported on a special basket
(Photo courtesy Heil Process Equipment Corp., Cleveland 11, Ohio)

through flue coils immersed near the bottom of the tank, resulting in an economical and rapid method of heating. This method is reported to be more efficient than the underfiring method. Shown in Fig. 5 is an immersion gas heated water jacket chromium plating tank having the lead lining supported on a special basket.

The use of proper equipment for handling and heating plating solutions may contribute to the efficiency and quality of the overall finishing operation. The plater should keep in mind that there are many new materials and methods available, and constantly being developed, so that with due consideration, proper equipment may be selected to fill nearly any industrial requirement.

* * *

Methods and Equipment for Baking Organic Coatings

THERE are several types of heat sources which can be used for baking organic coatings on metal products. Based on the recommendations of the Bakelite Corporation, any of the following sources may be used:

1. Electrically heated circulating air ovens.
2. Gas fired, circulating air ovens.
3. Infra-red baking units.
4. A combination of the regular gas fired convection type oven and infra-red baking.
5. Hot air. When baking the interior of objects, such as tanks which are too large to be placed in an oven, it is possible to make the container itself the oven by circulating a continuous stream of hot air into the tank until the resin film is sufficiently polymerized. The tank should be insulated against loss of heat by radiation. This method is used in coating storage tanks, railroad tank cars and chemical processing equipment.

The production man planning finishing schedules should keep in mind that the type of source of heat is not particularly important. It is the heat itself, uniformly applied, that is necessary to polymerize the resin film, no matter how that heat is produced. However, the heat should be dry; live steam is not recommended for baking phenolic resin.

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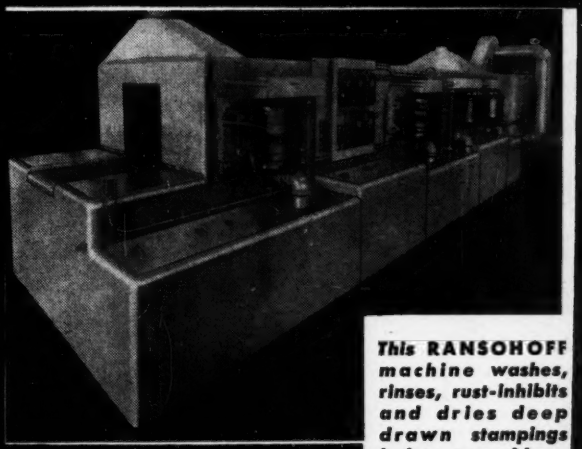

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Infra-Red Baking

Infra-red baking methods have found wide application, particularly in many conveyorized finishing systems. A completely conveyorized finishing system has many advantages, among which is the fact that it reduces handling and eliminates to a large extent the necessity for touch-up work. Shown in Fig. 6 is an infra-red baking installation.

To use radiant heat to the best advantage, it is obvious that consideration must be given to the normal laws governing its behavior. The materials to be baked by infra-red should be chosen for their adaptability to the advantages offered by it. One of these factors is the effect of polymerizing materials on the rate of film hardening at high temperatures. The fact should be recognized that economy and increased production will result from the judicious formation of protective coatings for the high temperature, short schedule baking made possible by radiant heating.

The type of finish is an important factor in the consideration of infra-red radiant heating. In general, it is recognized that the curing of finishes that utilize an oxidation reaction cannot be accelerated sufficiently to warrant the adoption of infra-red. Those finishes that cure primarily by polymerization or by evaporation are generally suitable to the infra-red process, the polymerization type finishes being particularly suited to short-cycle curing. Multicolored finishes on the same part may offer some difficulty in baking. For example, the dark finish on a part will heat faster and reach a higher end temperature than a lighter portion. Thus, under such conditions, there is danger of not obtaining the proper range of curing or baking temperatures for the different colored finishes. Special formulations of varicolored paints will sometimes equalize curing temperatures. Assuming a properly designed and engineered installation, the radiant heating method of curing organic coatings has flexibility and good control.

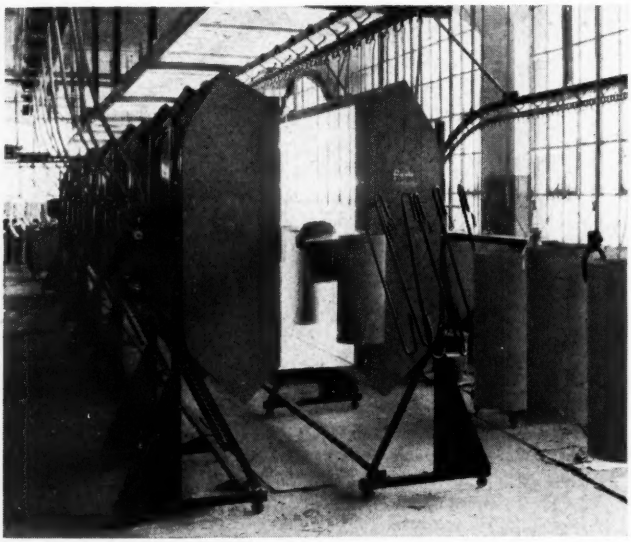

Fig. 6 — An infra-red oven being used in a finishing operation involving a variety of different parts *(Photo courtesy Fostoria Pressed Steel Corp., Fostoria, Ohio)*

Maintenance of Ovens

It has been brought out by the Fostoria Pressed Steel Company that an infra-red oven with the proper reflectivity may be as much as 500 per cent

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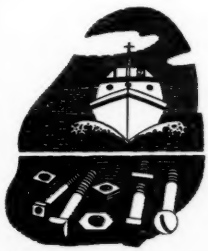

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more efficient than a non-reflective oven. This emphasizes the importance of proper maintenance of infra-red equipment. Reflectors used must be suitable and kept in good condition.

The time between cleaning periods for an infra-red oven varies considerably with the surroundings and the general quality of factory housekeeping. Some installations are cleaned weekly, whereas others have had their first cleaning after four years of service. There is no reason to touch an oven that is not obviously dirty, regardless of the length of its service. In many modern finishing plants, annual servicing undoubtedly suffices. In other locations, equipment requires cleaning in two or three months. In general, cleaning an oven every three months keeps it within 3 or 4 per cent of its optimum efficiency. Many plants have been observed to operate on a schedule whereby one-third of an oven is cleaned each month. In this way the entire oven is cleaned every three months, and the operating level is constant the year round.

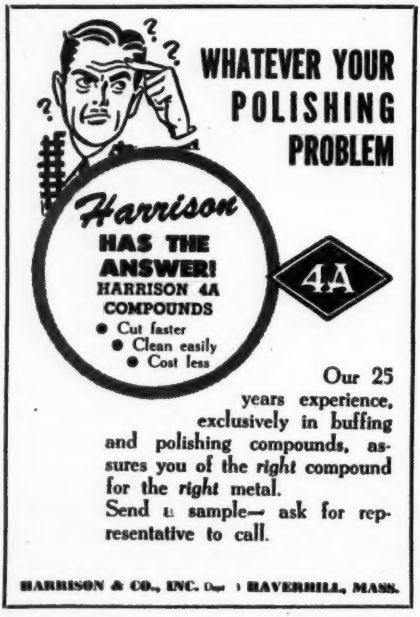
Cleaning methods, like baking cycles, vary with the problem. In many cases, it is possible to blow off with an air blast any loose dirt that has accumulated. If overspray has accumulated, it is better to remove the coating with a solvent rather than by hard rubbing with some polishing material. In general, where a polishing material is employed, one should be chosen that is as free as possible from abrasives. Pastes should be avoided in favor of liquids and the one that requires the least rubbing will prolong the life of the reflectors the longest.

Organic films are engineering materials in the sense that they, like all engineering materials, have a definite function to perform. In selecting the proper source of heat for baking organic coatings, the finishing engineer must consider the type of organic coating to be processed and the properties desired in the final baked film.

* * *

Some Effects of Surface Active Agents in Metal Cleaning

METAL finishing technologists are always interested in the factors which may effect the efficiency of metal cleaning operations. It has recently been brought out by Irvin Reich and Foster Dee Snell, of the Foster D. Snell, Incorporated laboratories, that the fact that a surface active agent lowers interfacial tension between water and oil does not necessarily ensure that it will increase the tendency of the aqueous phase to displace oil from a solid surface. (See also "Ind. & Eng. Chem.", July, 1948) As has been previously pointed out, the interfacial tension between the sol-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...fume control equipment correctly designed and manufactured is of vital importance ...ety and health of plant personnel, and results in product improvement. Schmieg ...pioneered this principle of dust and fume control.

...gineers call upon Schmieg to design and build dust and fume control equipment to ...nt and product. Typical installations by Schmieg include dust and dirt arresters, ...st air washers, kerosene and welding fume exhaust units, stock and dust handling ...n textile plants, cyclone collectors for brake lining dust, polishing and buffing ...rs . . . to name just a few.

...ust and fume control units give you (1) reduced operating and maintenance ... (2) maximum efficiency in the removal of dust and fumes for improvement of ...itions and product quality.

THE *best* AIR PURGE *is* CENTRI-MERGE

Our engineers will be pleased to consult with you in the solution of your problem

Schmieg INDUSTRIES INC.

Engineers & Manufacturers

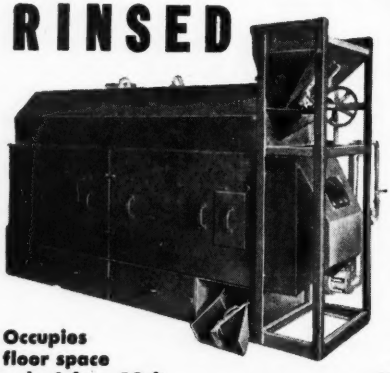
id and the liquid phases must also be considered.

The ability of an aqueous solution to displace oil from the surface of a solid can be expressed, as pointed out some years ago, in terms of the interfacial contact angle measured through the aqueous phase of the oil-aqueous-solid system. The smaller the angle, the greater tendency of the aqueous phase to spread over and wet the surface, and the greater the tendency of the oil to stand up in readily removed globules on the surface.

It was pointed out by Reich and Snell that the degree of lowering interfacial tension between oil phase and aqueous phase is able to serve as a semi-emperical measure of the tendency of the aqueous phase to displace oil from the surface of the solids. Further, low interfacial tension permits oil on the surface of a solid to emulsify readily. Such emulsification may occur and remove the great bulk of the oil, while leaving a thin film of the oil behind; thus, for some purposes the surface might be considered clean and yet the aqueous phase has not actually displaced the oil phase or wet the solid. It was pointed out that this would occur most completely when the oily coating is fluid and agitation is intense, and least thoroughly with mild agitation and a highly viscous oily coating.

One consequence of the preferential wetting behavior pointed out as a result of the work is that in some cases water soluble soaps could hinder metal cleaning instead of aiding it. In view of the contact angle of approximately 90 degrees, it can be expected that if steel coated with mineral oil containing polar substances is agitated with large amounts of water, the oil will be displaced and the steel thus cleaned. However, if a soap is present, the fatty acid formed by hydrolysis may enter the oil film and cause preferen-

2250 lbs. of SCREWS WASHED RINSED DRIED per hour



Occupies floor space only 6 ft. x 10 ft.

This machine cleans and dries 10 tons of machine screws every 8 hours—removes chips, cutting oil and shop dirt quickly, and thoroughly. Automatic feeder simplifies handling, provides continuous 'production line' operation. Return type saves floor space.

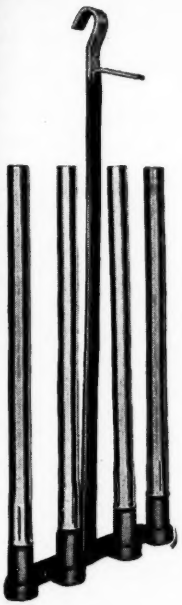
This machine is ideal for handling screw machine products, stampings, slugs, cups and other batch parts.

If you have a metal cleaning, pickling or drying problem, let us solve it.

METALWASH MACHINERY CORP.
149-155 SHAW AVENUE IRVINGTON 11, NEW JERSEY

ADHESION

PASTE INSULATION MUST HAVE GOOD ADHESION



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No. 1000

is high in quality and low in price. Best for all type racks.

The remarkable resistance and long life of Paste Rack Insulation is to a large extent due to the Primer coat, which provides adhesion. BUNATOL Primer is a one coat job. A single dip tank and just one labor operation. That means faster work and time saved; plus the saving in actual labor cost.

The Primer does give excellent adhesion to all rack metals. It sticks tight and holds the thick single coat of Paste Insulation down to the rack so there is no seepage or carry over.

Compare! Even if you are now using a Paste Insulation find out about BUNATOL prices; long life quality; and what can be saved in application labor. If operating costs mean anything in your shop then investigate. Full information, sample and prices are yours for the asking.

NELSON J. QUINN COMPANY
Toledo 7, Ohio

BUNATOL

tial wetting of steel by oil to such an extent that the oil will not be displaced. If the oil film is also fairly viscous and agitation is not extreme, little emulsification can be expected, and substantially no cleaning will occur. This condition was brought out in experiments shown in Table I, wherein steel washers soiled by smearing their surfaces with a thin film of oil prepared by mixing 37 grams of powdered umber with 56 grams of a medium viscosity mineral oil were cleaned. The experiments indicated that, at least under some conditions, soaps did not hinder proper cleaning.

Synthetic anion active agents are generally salts of comparatively strong acids; as a result, they show less hydrolysis than soaps. Sulfonates being salts of weaker acids, should hydrolyze more than sodium salts of organic sulfates. It can be noted that the experimental results, in general agree with this. The straight sulfonate prevents soil removal under the conditions used, but the effect is considerable only at high concentrations whereas the sulfated agent did not prevent soil removal at the highest concentration used; namely 3 per cent. The non-ionic agents tested did not appear to inhibit soil removal; observations showed that at high concentrations they actually aided in the cleaning process.

The experimenters reasoned that in sufficiently alkaline solution, hydroly-

Solution		Grade of Rings[1]	Solution		Grade of Rings[1]
Distilled water		B+	Sodium alkyl aryl sulfonate[2]	0.2%	B—
				0.5%	B—
Sodium oleate	0.02%	E		7.5%	B
	0.05%	E			
	0.1%	E	Sodium coconut oil sulfate	0.02%	B
				0.05%	B
				0.1%	B
Triethanolamine oleate	0.02%	E		3.0%	B
	0.05%	E			
	0.1%	E	Nonionic X	0.02%	B+
	0.2%	E		0.05%	B+
	0.5%	E		0.1%	B+
	1.0%	E		0.2%	A—
	3.0%	E		3.0%	A—
80% Tallow, 20% coconut chip soap	0.02%	D—	Nonionic Y[3]	0.06%	B
	0.1%	E		0.15%	B+
	0.2%	E		0.3%	B+
	1.0%	E		9.0%	A
Sodium alkyl aryl sulfonate	0.02%	B—	Lauryl pyridinium Chloride	0.02%	B
	0.05%	C+		0.05%	B
	0.1%	C		0.1%	B
	0.5%	C		0.5%	B
	3.0%	D+		3.0%	B+

[1] *A=complete soil removal, leaving a bright spotless metal surface; B=fairly clean but somewhat dull surface with a few adherent specks of soil; C=very dull surface with many specks of visible soil; D=dirty surface with some underlying metal visible; E=retention of uniform opaque coating of soil.*

[2] *Approximately 40% active, 60% sodium sulfate.*

[3] *Approximately 30% active, 70% water.*

TABLE I

Experiments on Cleaning of "Oiled" Steel Rings by Solutions of Surface Active Agents (*Courtesy Ind. & Eng. Chem.*)

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... ell pleased wit ... unds. Our finish ... 31 Perfection Fi ... ree Gr ... t is imp ... Com- ... your ... NEW ... CERN

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... all respects ... that ... MANUFACTURER

"Superior to ... . . . further ... selling for 2 ... 32c for ... ABLE S ...

... Greaseless Compounds ... hate ... d to ... ndly ... dule ... done a fine ... ur in ... T MANUFACTURER

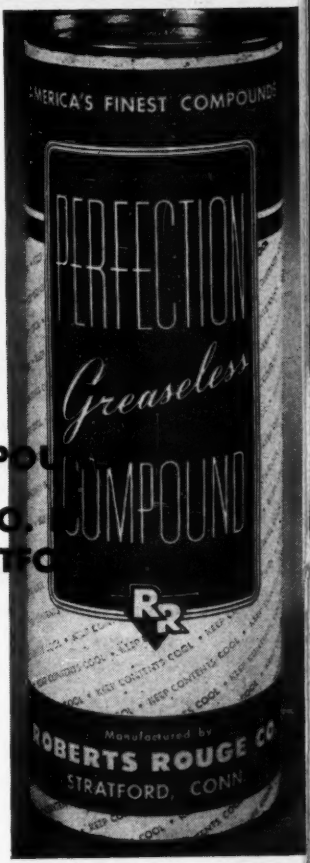
... appy . . . and ... savings." ... MACHINE MANUFACTURER

... weekly basis."
INDIANA CONCERN

"For a long time we have been looking for a time-saving greaseless compound. After using yours, our expectations were exceeded by far."
DIE CASTING COMPANY

... e save money by using Roberts Greaseless. It ... finishing costs tremendously . . ."
VACUUM CLEANER MANUFACTURER

20c PER POU... F. O. ... STRATFO...



...ere is only one way to convince yourself of the superiority of ...OBERTS GREASELESS . . .

Send for Free Sample

ROBERTS ROUGE CO.
STRATFORD • CONN.

Solution of Agent in 2% Sodium Metasilicate		Grade of Rings*
No agent		B+
Sodium oleate	0.02%	A—
	0.2%	A—
Sodium alkyl aryl sulfonate	0.2%	A
	3.0%	A

* *Defined in Table I.*

TABLE II

Experiments on Cleaning of "Oiled" Steel Rings by Solutions of Surface Active Agents in the Presence of 2% Sodium Metasilicate

(*Courtesy Ind. & Eng. Chem.*)

sis of soap should be repressed to the point where the effect would no longer occur. A few experiments were run in 2 per cent metasilicate solution. As shown in Table II, sodium oleate and the sulfonate in this alkaline solution did not inhibit soil removal. In fact, the combination of metasilicate and sulfonate surface active agents proved to be quite effective in cleaning the soiled washers.

As a result of this work, metal cleaning technologists may realize that the effects due to sorption of detergent or hydrolytic products of the detergent are probably more common than is usually appreciated. The preferential wetting characteristics of the detergent solution compared with the oil constituents of the soil, as modified by sorption of the detergent or its hydrolytic products onto the specific soil and surface, must always be considered in a fundamental approach to cleaning problems.

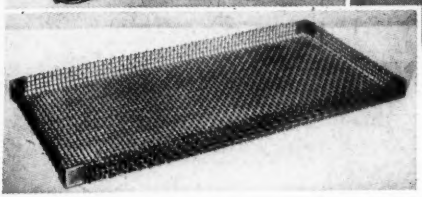
* * *

Proper Spray Gun Technique Essential for Economical Finishing

WHILE the major aim of the modern finishing room is for speed, it is well to bear in mind that there are certain limitations which make for efficient spray finishing. One important point is that the spray operator should use a stroke only as wide as can be applied conveniently and effectively. A wasteful spray practice is holding the gun too far from the work; another wasteful practice is carrying the strokes too far beyond the ends of the piece. Still another poor practice is jumping about over the work. It is important that the spray gun operator start at one end and cover the entire surface with the minimum of waste motion. "Doubling back" motion should be minimized when possible.

The selection of correct spray patterns is of great importance for economical finishing. Thus, in covering long rods, or similar objects of this type, the pattern should be just wide enough to cover the surface to avoid excessive overspray. Large surfaces should be covered with as wide a spray pattern as practical. However, it has been pointed out as a result of work carried out by the Binks Manufacturing Company that if the spray pattern adjustment is too wide or the air pressure too high, a "split spray," such as illustrated in Fig. 7, may result. One method of determining this point is to hold a piece of white cardboard in front of the spray gun at the normal distance. The gun should be opened for an instant and the pattern which is produced observed. It should be even and oblong if a wide area is to be covered with each stroke. If there is a skimped area in the center, as is illus-

Cambridge WIRE CLOTH and FABRICATIONS...



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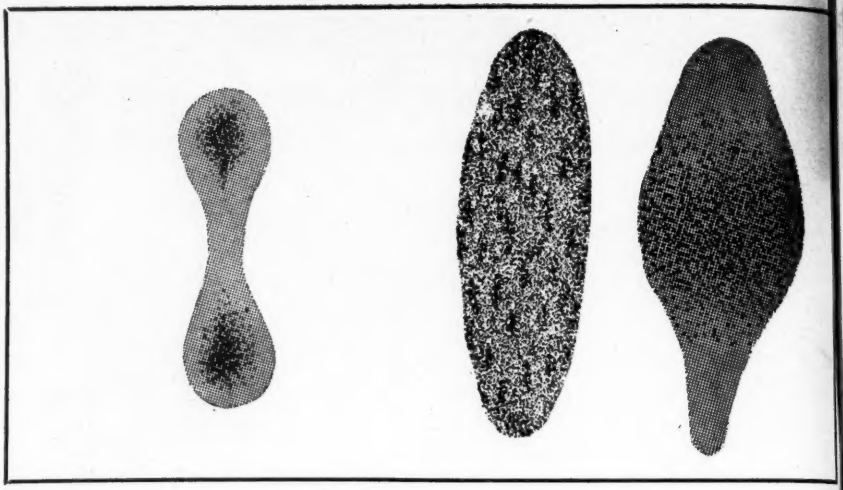


Fig. 7 (Left)—A split spray or one that is heavy on each end of a fan pattern may be caused by too high an atomizing air pressure or an attempt to get too wide a spray with thin materials. (Right)—A fan spray pattern that is heavy in the middle or a pattern that has unatomized "salt and pepper" effect may indicate that atomizing pressure is not sufficiently high.

(Illustrations courtesy Binks Manufacturing Co., Chicago 12, Ill.)

trated at left in Fig. 7, proper steps should be taken to correct the difficulty. It can be seen that a split spray produces an uneven coating that requires doubling back and results in wasted material as well as loss of time. A fan spray pattern that is heavy in the middle, or a pattern that has an unatomized "salt and pepper" effect, such as illustrated on the right in Fig. 7, indicates that the atomizing pressure is not sufficiently high.

It is important that spray guns be maintained clean and in good condition. It is poor practice to place an entire spray gun in thinner to clean it, for the essential lubricating oils may be removed and parts will corrode. A good practice to follow is to clean the inside by spraying solvent thinner through the gun and the outside by brushing with a stiff brush dipped in the solvent. Deposits may build up on the gun which will produce "spitting" during spraying and give a distorted pattern. In general, material of this type should be removed by dissolving in thinner, rather than by gouging with a knife or other instrument, since such practice may harm the spray gun cap and orifices and thus impair operating efficiency as well as increase maintenance and replacement costs.

Glycerine now used in more than 1,500 processes at the rate of about 200,000,000 pounds a year had its first commercial use in the United States just 100 years ago. Discovered by the Swedish chemist Karl Wilhelm Scheele in 1799, this fluid first appeared in retail drugstores in Philadelphia in 1848. The first commercial manufacturer was Robert Shoemaker of Philadelphia who produced glycerine by evaporating water used in cooling lead plaster.

In the spirit of friendliness and mutual helpfulness which has prevailed during our contacts throughout the years we send our thanks and heartiest greetings for Good Health, Good Fortune and Peace in the days that are to come.
MacDermid Incorporated
MAC DERMID INCORPORATED, WATERBURY 88, CONNECTICUT

NEWS of the Industry

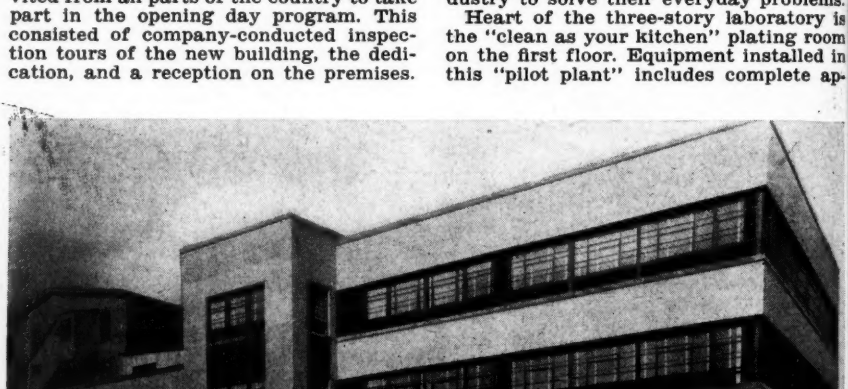
NEW PLANTS

H-VW-M Opens New Electrochemical Laboratory

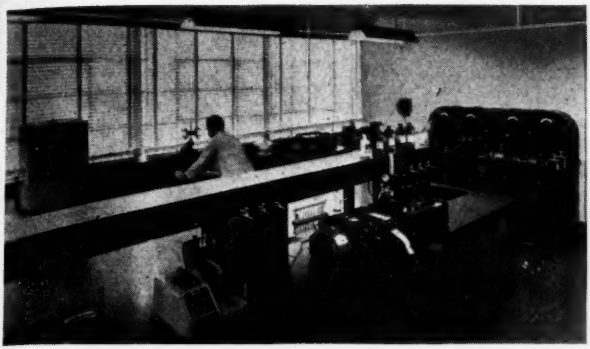
The formal opening of the new Hanson-Van Winkle-Munning electrochemical laboratory at Matawan, New Jersey, was celebrated November 17. In observance of the occasion, representatives of the press, technical societies, and prominent individuals in public life were invited from all parts of the country to take part in the opening day program. This consisted of company-conducted inspection tours of the new building, the dedication, and a reception on the premises. At the dedication, guests were welcomed by Louis M. Hague, president, and Van Winkle Todd, chairman of the board of H-VW-M. Technical Director Myron E. Diggin then formally accepted the research laboratory on behalf of his staff and H-VW-M employees.

The H-VW-M laboratory, with its more than 15,000 square feet of floor space, was specifically designed and erected for the sole purpose of carrying on experimental and service work in the electroplating and polishing field. It contains the most advanced facilities available for research and development in the industry and for helping individual companies in the industry to solve their everyday problems.

Heart of the three-story laboratory is the "clean as your kitchen" plating room on the first floor. Equipment installed in this "pilot plant" includes complete ap-



Exterior view of new Hanson-Van Winkle-Munning laboratory, Matawan, New Jersey



View of section of one of the main laboratory rooms showing the modern equipment and facilities available for electrochemical research

paratus for experimental and sample cleaning, pickling, plating, and anodizing. Among the solutions in use in the pilot plant are the H-VW-M amine copper solution, Albaloy alloy plating bath, rapid hard type nickel solution, and the 9H bright nickel. In this plant will be conducted most of the final tests from which will come concrete recommendations to the industry. The equipment includes virtually every known device for scientific operation and control of electroplating solutions. Efficiency, advanced instrument control, comfort and safety of technicians, accessibility of services and, most important of all, sufficient flexibility in the arrangement of apparatus to permit alterations to meet changing needs, were major considerations in the setup.

The floor is covered with acidproof bricks which are pitched in various directions to the drainage troughs under each line of tanks. Silicon-iron waste lines carry drainage to an outside treatment plant. Overhead, vapor-proof fluorescent fixtures provide uniform lighting for night work, while continuous window areas on two sides combine with highly reflective walls and ceilings to eliminate the need for artificial light during normal daylight hours.

A complete air change can be made in the plating room every 1½ minutes, if desired, through ducts that provide cooled air in the summer and warmed air in the winter. Air to replace that drawn out is furnished through a louvered duct from the outside. Three exhaust blowers and one intake fan keep the room under slight pressure, thus keeping out dust and preventing contamination of plating solutions. Current is supplied by two d.c. motor generator sets, one with a 1,500-ampere capacity at 6-12 volts and the other a 500-ampere 40-volt unit. Portable low-voltage rectifiers are available for auxiliary direct current. Pipes for gas, steam, and various liquids are color-coded for identification.

A large analytical laboratory on the second floor is used primarily for customer service, involving the analysis of plating solutions and investigating difficulties encountered in the application of electrodeposits. The research laboratory is devoted to the investigation of new products and processes and fundamental studies of finishing problems. Both departments are equipped with double fume

Partial view of plating room showing standard process tanks and equipment for cleaning, pickling, and plating

New Michigan Abrasive Company manufacturing plants

which were processed bright nickel plated souvenir spinning coins for distribution to the guests.

---

hoods with built-in flush-mounted six-kilowatt hot plates, Diggin electroplating control tables, and provisions for replacing air withdrawn by hoods with forced, filtered, fresh air. Additional rooms on the floor house a metallographic laboratory, dark room, balance room, and offices.

In the right wing of the second floor is a laboratory for investigating, developing, and testing polishing and buffing compounds and materials. A feature of this laboratory is a custom-built, precision buffing machine used for exact valuation of buffing and coloring compositions, as well as for basic research in the field. An intercommunication system closely links the laboratory's 33 rooms.

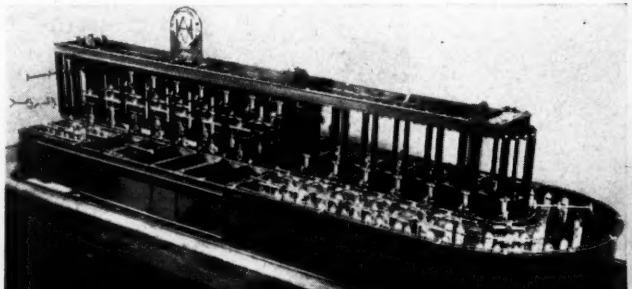
H-VW-M officials expressed the double hope that everybody in the industry would visit the new laboratory and that companies in the industry would use the facilities as a pilot plant to determine correct solutions and cycles before changing over to new types of plating jobs. Since several technical societies have already scheduled their 1949 conferences in the new building, a good part of this wish seems well on its way to fulfillment.

On exhibit at the laboratory was the H-VW-M full automatic elevator type conveyor model plating machine through

THE MICHIGAN ABRASIVE COMPANY recently moved its complete fabricating facilities and general offices into two new buildings at 2360 West Jefferson Avenue, Detroit, in order to provide additional floor space required by business expansion. These fabricating facilities include new high-capacity ovens for manufacturing resin bonded industrial abrasives. Abrasive manufacturing equipment and operations will continue in the company's old plant at 1111 Bellevue Avenue and will supplement the new facilities.

Formal opening of the new plants was celebrated October 29 with an open house, at which Max C. Jones, Michigan Abrasive president, explained the manufacturing operation to visitors. Other Michigan Abrasive officers present at the open house included Frederick P. Hauck, vice president in charge of manufacturing; C. H. Wills, general sales manager; Louis F. Guetschow, assistant secretary-treasurer; and Robert O. Blackford, advertising and sales promotion manager.

LITHGOW CORPORATION, Chicago, Ill., applicator of protective linings based on Bakelite phenolic resins, announces



This Model H-VW-M full automatic elevator type conveyor runs a complete, automatic plating cycle in a machine only 7 feet 3 inches long and 2 feet wide. The machine is an excellent example of the model maker's art, and includes every operation in the plating cycle, from the preliminary cleaning through the acid dips, rinses and plating operations, turning out a bright plated product.

NEW!

Here's the "Inside Story" on Cleaning Metal Parts and Products

28 PAGES
FULLY-ILLUSTRATED

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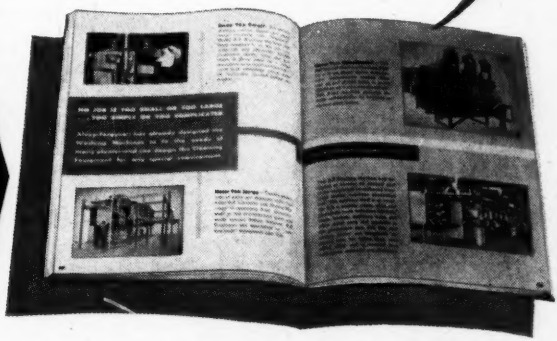

Here, in this new 28 page file size booklet are presented all of the factors to be considered in making the proper choice of equipment for thoroughly cleaning practically every type of metal parts and products. This new A-F book carries the reader quickly through all construction features. A section of the book is devoted to Completely Co-ordinated Conveyorized Systems engineered to solve specific problems in leading industries. Flow charts show clearly how A-F Cleaning and Conveying Equipment can be integrated into a line production system. Write for your FREE copy—today!

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the opening of its new plant at Norwalk, Connecticut, the first plant of its type in the New England area.

COMPANIES

THE NORTON CO., Worcester, Mass., has issued a memorial edition of "The Norton Spirit" in memory of the late Aldus C. Higgins, chairman of the executive committee, and life-long Norton executive. In addition to a detailed record of Mr. Higgins' business and professional life, the booklet contains a memorial message from Rev. Walter D. Kring, a resolution passed by Norton's Board of Directors, editorials written by Mr. Higgins and photos of Mr. Higgins illustrating the wide range of his interests during a very active life.

AMERICAN NICKELOID CO., Peru, Ill., is celebrating the 50th anniversary of the founding of the company. Organized originally to produce nickel-plated zinc sheets, the company expanded its interests and activity so that, through the years, pre-plated tinplate, brass, copper, steel, and aluminum have been manufactured. In 1923 a mill was established in Walnutport, Pa., to supplement the activities of the Peru plants. At present a new plant at Peru is being planned.

TITEFLEX, INC., 500 Frelinghuysen Ave., Newark 5, N. J., has announced the appointment of Manufacturers Sales Agency, 523 Brushton Ave., Pittsburgh 21, Pa., as exclusive sales agents for Titeflex products in western Pennsylvania and West Virginia.

The American Brass & Copper Co., Oakland, Calif., has been appointed a specialty distributor of Reynolds aluminum products, according to an announcement by David P. Reynolds, vice president, General Sales Division, **REYNOLDS METALS CO.**, Louisville, Ky.

Another California firm, the Western Metals & Supply Company, San Diego, has also been made a Reynolds distributor and is now handling a general line of aluminum mill products.

J. F. Roche, president of **BINKS MANUFACTURING CO.**, 3114 Carroll Ave., Chicago, Ill., manufacturer of spray painting and water cooling equipment, announces the establishment of a Customer Service Department for specialized handling of customers' inquiries.

To make customer service of greatest value to Binks customers, the department has been established as an independent unit that is answerable to no other department. Under the new system, incoming calls and correspondence requesting information are channeled directly to Customer Service. The staff of this department collects all required information and answers requests promptly. Delivery promises, quotations, and so on, are checked daily to keep customers informed as to the progress of the work.

According to Mr. Roche, the new department, which went to work October 1, has already demonstrated its value and effectiveness to customers as well as to other departments of the company. The department is under the direction of Joseph Vokoun, who has been with Binks for 20 years.

CLEAN METAL

HOW? Where removal of oil is a factor and no additional steps in cleaning cycle are desired, we recommend Eskay Metal Cleaner. Its a new approach to an age old problem and really does the job. Further facts on request.

Stuart INDUSTRIAL SERVICE, INC.

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Pittsburgh brushes are specifically designed to meet your particular finishing requirements. They're tough enough, stiff enough to resist abrasions. They're soft enough to improve surface texture. And the perfect balance of Pittsburgh brushes carefully controls distribution of the brushing stock—provides top efficiency, enduring economy.

In the complete Pittsburgh line are brushes of all types. "Perfect Balance" sections. Wheels and assemblies. Uni-fill scratch brushes.

Consult the Pittsburgh engineering representative today. He'll gladly work with you in developing any type of power-driven brush. And you can be sure it'll do the job right!

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Steel rule and depth gauge, 6", complete with pocket clip, and attractive leather case. Yours for the asking . . . write Pittsburgh Plate Glass Company, Dept. W-4, Baltimore 20, Md.

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PITTSBURGH PLATE GLASS COMPANY

MIXING EQUIPMENT CO., Rochester, N. Y., manufacturer of mixing and agitation equipment, has announced the appointment of a new Virginia representative, the O'Neill Pump and Engineering Company of Richmond.

THE METALWASH MACHINERY CORPORATION takes pleasure in announcing the opening of its new Western office located at 1130 West Olympic Boulevard, Los Angeles 15, California. J. Sigmund Berlie will be in charge of this office. Mr. Berlie has had many years of experience in the washing and pickling of metal parts and is available for consultation and information regarding all types of metal washing, pickling, drying, and processing machinery.

NEW POSITIONS

Appointment of **DR. JAMES R. DONNALLEY** as manager of General Electric's silicone manufacturing plant at Waterford, New York, has been announced by John L. McMurphy, manager of the Chemicals Division.

Ralph C. Persons, general manager, Geo. H. Morrill-General Printing Ink Division, Sun Chemical Corporation, announces the appointment of **JOHN P. MATHER** as New England district manager.

Mr. Mather will assume the duties of Edmund J. Shattuck who has been associated with Geo. H. Morrill for more than 38 years. Mr. Shattuck is retiring from active participation because of ill health.

Three appointments to positions of industrial zone sales managers have been announced by G. L. Hehl, general manager, Industrial Sales, The Sherwin-Williams Company, in line with the company's new program of expansion in the industrial field.

E. H. STEGER will be in charge of the Textile Industrial zone with headquarters in Charlotte, North Carolina; **D. S. SHIMP** will head the Southeastern Industrial zone with headquarters in Atlanta, Georgia; and **J. R. STEVENSON** will manage the Gulf Industrial zone with headquarters in Dallas, Texas.

Norton Co., Worcester, Mass., has announced the following changes in personnel in the Norbide Division:

JOHN W. McCUE has been transferred to the abrasive division training course from his territory in Chicago.

GEORGE H. POWERS, who has covered the New England territory, will take over the Chicago area.

SHELDON V. COLEMAN, formerly of the sales department in Worcester, has been appointed boron carbide engineer in the district recently occupied by Mr. Powers.

Three changes in the Norton Abrasive Division sales force have been announced.

A. W. COX, formerly abrasive engineer in the St. Louis area, has been shifted to a newly established territory in southern California.

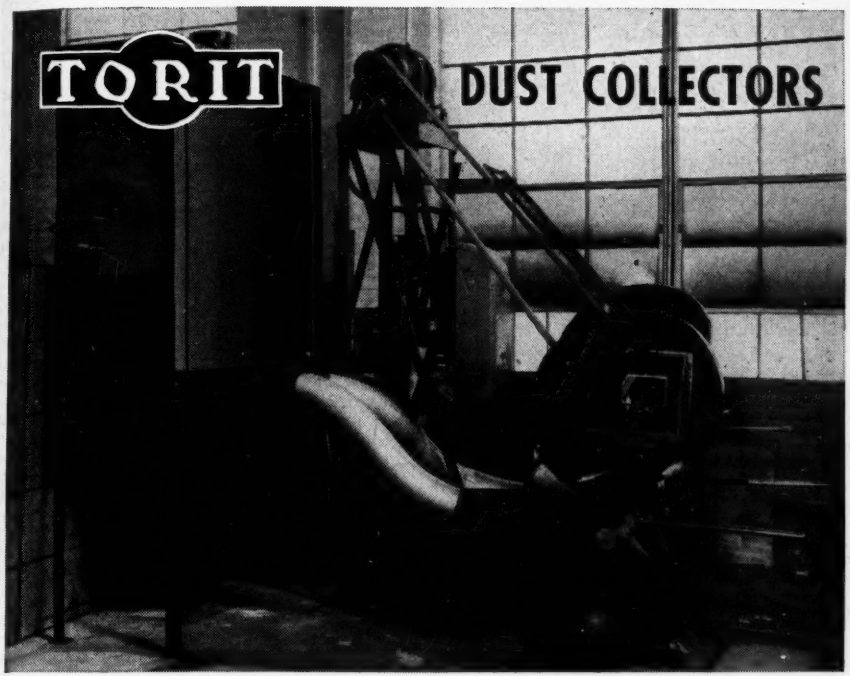
E. H. STYFFE, abrasive engineer, has been moved from Pittsburgh to take over Mr. Cox's responsibility in St. Louis.

CHARLES H. KRANE, formerly field engineer in Connecticut, has been appointed abrasive engineer and will cover the territory vacated by Mr. Styffe in Pittsburgh.

• ***BETTER FINISHING***
• ***LOWER COST***

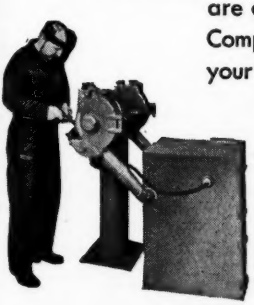
Especially designed for high speed cylindrical work, "PRODUCTION" MODEL 101 centerless feed polishing machine produces better finishing at lower cost. It feeds automatically without centering, chucking or holding. All parts are guarded and readily accessible for changing the wheel. The construction is rigid and durable throughout. Any desired finish on rods, tubes or bars, 1/4" to 6" in diameter.

Production
MACHINE COMPANY GREENFIELD MASSACHUSETTS U.S.A.



meet the "steady grind" of this foundry

This is the *Torit* No. 122 Dust Collector. It handles a large volume of abrasive dusts efficiently. There is a minimum of piping, and the cleaned air is recirculated, reducing heat losses. It runs only when the grinders are operating, and is easy to keep clean.



Compact, self-contained *Torit* Dust Collectors will solve your dust problem. Moderately priced, they fit easily into present and future production layouts. Standard models, up to 5 H.P. are available for immediate delivery. For details and the latest Torit catalog, write:

TORIT MANUFACTURING CO.

314 Walnut Street St. Paul 2, Minn.

The Hanson-Van Winkle-Munning Co., Matawan, N. J., announces the addition of **CHARLES E. CAMPBELL** to its sales force. He will make his headquarters in the Detroit office.

Mr. Campbell is a graduate of the University of Toledo, and was assistant to the chief chemist at the Gordon Manufacturing Co., Toledo, Ohio, before joining H-VW-M.

The Metric Lacquer Manufacturing Co., 62-70 Woolsey St., Irvington 11, N. J., announces the appointment of **DR. MARCUS THAU** as director of research, development and production.

Dr. Thau brings to his new position more than 25 years of experience in the field of protective and decorative coatings. Among his most important contributions in recent years is the development of exterior aircraft finishes designed to reduce friction in flight and thereby increase the speed of military planes.

Dr. Thau is an active member of the New York Paint, Varnish and Lacquer Production Club; he holds the chairmanship of its Sub-Committee 54 which is currently investigating the influence of pigments on the electrical properties of paint, varnish and lacquer films.

R. A. Emmett, president of the Detrex Corp., Detroit 32, Mich., has announced the appointment of **GARRETT C. VAN DE RIET** as controller.

Mr. Van de Riet, who has been with Detrex for the past six years, has been on special assignment in the Industrial Equipment, Dry Cleaning, Oil Extraction, and Solvent Divisions of the company.

Appointment of **L. D. YAGER** as division manager of the Detroit sales office, Aluminum Division, and industry manager, Automotive Division, Reynolds Metals Company, has been announced by David P. Reynolds, vice president, General Sales Division.

Mr. Yager has been connected with Reynolds for 20 years, and for the last three years was product manager of the Sheet Division at Louisville.

HOLLAND SAYS:
BUFFING GIVES A FINER FINISH
Heavy Duty Ball Bearing Polishing Machine. V Belt Drive — available in all sizes for immediate delivery. Motors can be either inside or outside of base.
Wide selection of metal finishing equipment on hand. Write for FREE folder "M."
J. HOLLAND & SONS, INC.
MANUFACTURERS • DEALERS
276 SOUTH NINTH ST. • BROOKLYN, N. Y.

V. C. LEATHERBY has been named Pittsburgh district engineer for Industrial Ovens, Inc., Cleveland, Ohio, according to an announcement by C. A. Litzler, Industrial Ovens president. Mr. Leatherby brings to this new association a successful career as sales engineering representative in Pittsburgh and Cleveland for companies in lines allied to Industrial Ovens' activities in the industrial heating and processing fields. He maintains offices at 908 Peoples East End Building, Pittsburgh.

E. L. Faulman, president of National Rack Co., Inc., Fair Lawn, N. J., announces the appointment of **L. D. FAULMAN** as executive manager of Imperial Plating Rack Co., 800 Industrial Ave., Flint, Michigan. This new rack company will engineer and manufacture all types of plating and anodizing racks, featuring a new "Jiffy Tip" which will be removable and replaceable.

Mr. Faulman was formerly sales manager of National Rack Company, Inc., and has a wide background in the engineering, sales and manufacturing of all types of plating racks.

ECLIPSE SPRAY GUNS

ARE PLENTY TOUGH

Simplified one-piece construction—all vulnerable moving parts protected—easily serviced and plenty tough.

The most important part of any spray gun is "the nozzle." Eclipse nozzles are not made of brass but of hardened steel, especially designed to take plenty of punishment and continue to give continuous top performance.

Do you want to reduce paint waste—paint faster and better—get a smoother finish, a brighter gloss?

Use Eclipse Spray Guns and Low Pressure Spray Equipment

Send for our complete catalogue

Write: ECLIPSE AIR BRUSH COMPANY
Park Avenue & 14th Street • Newark 7, N. J.

Spray Equipment Division
ECLIPSE
Manufacturers of Low Pressure Spray Equipment Since 1908

DR. JOHN G. DEAN has been appointed head of the Industrial Chemicals Section, Development and Research Division of The International Nickel Company, Inc., it was announced by T. H. Wickenden, vice president in charge of the division.

Dr. Dean has been associated with the activities of the Industrial Chemicals Section since 1942, serving first as Senior Fellow for International Nickel's multiple fellowship at the Mellon Institute in Pittsburgh, and then as Advisory Fellow to that program in New York.

E. H. Bucy, general manager of the Industrial Finishes Department at the Atlas Powder Company, Wilmington, Delaware, announces the following promotions at the Stamford, Connecticut branch: **DONALD A. METZ,** general manager; **W. G. SHEANE,** sales manager; and **JOHN E. FORSTER,** plant manager.

Mr. Metz, was formerly assistant general sales manager at Stamford.

Mr. Sheane, formerly a member of the Atlas technical staff, Stamford, is a graduate of Rensselaer Polytechnic Institute and Carnegie Institute of Technology.

Mr. Forster, prior to his new position, was supervisor of the Plant Service Group at the Stamford branch.

Recent promotions in the Chemical Department of the General Electric Co., Pittsfield, Mass., include the following: **DR. CHARLES E. REED** has been named engineering manager; **HARRY K. COLLINS** has been named manager of the Plastics Division, assisted by **ROBERT L. GIBSON; JOHN L. McMURPHY** has been named manager of the Chemicals Division.

M. J. Hoover, Eastern manager of the Sigmund Ullman and Eagle Printing Ink Divisions of Sun Chemical Corporation, announces the appointment of **C. A. ALOIA** as assistant general manager. Mr. Aloia has been chief chemist in the Eastern area for the aforementioned divisions, and will continue in that capacity in addition to his new duties.

Appointment of **ROBERT B. ANDERSON** as Chicago sales representative for the Chemical and Pigment Division of The Glidden Co., Cleveland, Ohio, has been announced by Ralph B. Quelos, general sales manager of the Chemical and Pigment Division.

Mr. Anderson will maintain his headquarters at 14935 S. Avers Ave., Midlothian, Ill. His background includes sales and technical service work in the paint field.

Carl J. Schumann, president of the Hilo Varnish Corp., Brooklyn, N. Y., has announced the following sales representative appointments: **HARRY FELS** as technical engineer in the Philadelphia district, and **PHILIP LANDAU,** as technical engineer in northern New Jersey. Both men will assist William Gloeckner who has long represented Hilo in these territories.

JAMES TAYLOR has been assigned to the western Massachusetts and eastern New York territory for trade sales, and **JOHN SCHUSTER** takes over the northern New Jersey area for the same department.

MERRY CHRISTMAS

to you

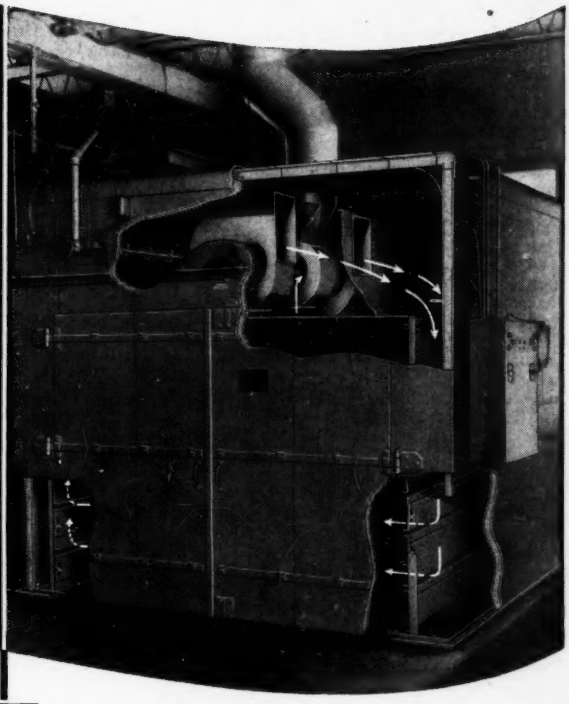
McKeon's
Liquid Sulphur

SULPHUR PRODUCTS CO.

Greensburg 6, Pa.

The Well Designed Industrial Oven

does a better job at less cost



This batch type oven used equally well for core, insulation, paint and grinding wheel baking—also low temperature heat treating, plastic curing and other processes, is a compact, self-contained unit. Recirculating heaters and exhaust fans are integral parts of the oven assembly for maximum heat conservation, greatest economy of plant space and better appearance. Note they are entirely within the oven frame.

Although gas heating is illustrated here, any other type of heating is equally applicable.

A single drive motor operates both recirculating and exhaust fans for maximum power saving.

A positive movement of heated air across the work space assures uniform baking temperatures throughout the entire load and maximum baking efficiency.

Field installation is greatly facilitated by the use of a completely wired operating control panel. All operating and control parts are readily accessible for inspection, service or adjustment.

Consult a Young Brothers Engineer before deciding on any industrial oven equipment.

Young Brothers Co.

6513 MACK AVENUE • DETROIT 7, MICHIGAN

YB CO

Recent additions to the Chicago group of Graham, Crowley & Associates, Jenkintown, Pa., have been announced. **FRANK K. SAVAGE** has recently been elected vice president. Previous to joining the Chicago research and development group, Mr. Savage had been engaged in the development of electroforming processes with C. G. Conn, Ltd., Elkhart, Ind. There Mr. Savage was successively chemist, chief chemist, and general superintendent. After leaving C. G. Conn, Ltd., Mr. Savage became superintendent of the Metals Division of Kuehne Manufacturing Co., Mattoon, Ill. Later he became vice president of the Standard Plating Rack Company, Chicago. Mr. Savage will direct company efforts in connection with consultation, research and development in the electroplating field in the Middle West area.

DR. W. M. LANGDON has recently been elected vice president. Dr. Langdon will remain in the Chicago laboratory of the firm where he has been located since joining the staff. He was previously located at Rensselaer Polytechnic Institute.

JAMES H. CONOLLY has recently joined the Chicago staff. Mr. Conolly was formerly with the Newton Falls Division of the Standard Steel Spring Company as electroplating and industrial waste disposal engineer. Mr. Conolly's new duties will involve research in the field of electrochemistry.

W. C. POLLARD, formerly with the Chrysler Corporation at Highland Park, Michigan, has joined the Chicago research staff. Mr. Pollard's new activities will involve research in primary cells and other related phases of electrochemistry.

Dwight P. Joyce, president of The Glidden Co., Cleveland, Ohio, has announced the promotion of **JAMES C. RANKIN** to the post of executive assistant.

Formerly manager of specialty sales, Mr. Rankin joined Glidden in 1942. He attended Fenn College and studied business administration at Harvard University.

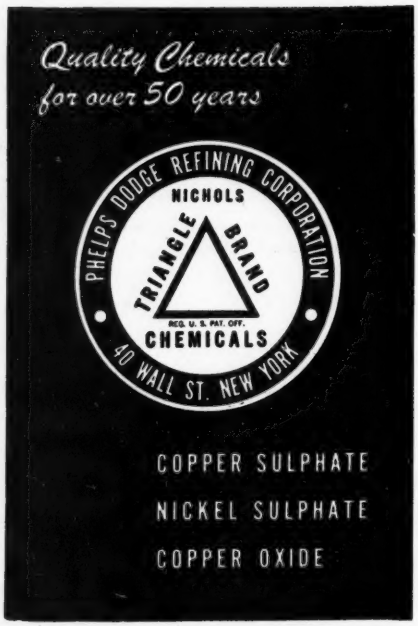
The Porter-Cable Machine Co., Syracuse 8, N. Y., announces the appointment of **JOHN A. PROVEN** as general sales manager.

Mr. Proven had previously held the position of vice president and sales manager of the Sterling Tool Products Company of Chicago, and is well-known in industrial distribution circles. He is a member of the executive committee of the American Supply and Machinery Manufacturers Association.

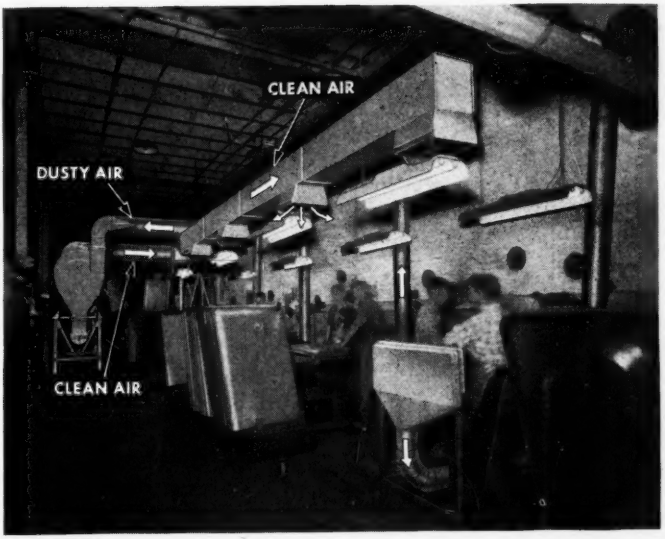
The International Rustproof Corp., Cleveland, Ohio, has announced the appointment of **DR. FRED E. KENDALL** as vice president, director of research and sales.

Dr. Kendall served as chief chemist in charge of electrochemical research for Republic Steel Corporation for a number of years and more recently as director of research for the Master Builders Co., Cleveland, Ohio. He was formerly a member of the chemistry staff at Western Reserve University, Cleveland, and later was associate professor of chemistry at the University of Maryland, College Park, Maryland.

Appointment of **JOHN S. CORT, JR.,** as assistant to the president of Martin Dennis Company of Newark and Kearny, New Jersey, has been announced by A. L. Geisinger, president. The company, a subsidiary of Diamond Alkali Co., Cleveland, Ohio, manufactures chromium chemicals.



Air Tumbler



THE MASTER OF DUST IN INDUSTRY

This picture shows what can be and is being done with the AIR-TUMBLER, a Wet Dust Collector which wets the dust but not the air. This ventilating system could be so designed because of the AIR-TUMBLER'S

MAXIMUM EFFICIENCY, (The dust-free air is fully recirculated and discharged directly above the heads of the men working on the four grinding benches served by the AIR-TUMBLER.)

AND MINIMUM HUMIDIFYING ACTION. (The returned air is so slightly humidified that the men can work in its direct path without being chilled.)

In addition, the AIR-TUMBLER is serving management by economy in power consumption and by savings in heating and maintenance costs.

Write for explanatory booklet.

Copyright 1948 by G. C. Ziliotto

DUST SUPPRESSION & ENGINEERING CO.
LAKE ORION • MICHIGAN

The appointment of **HYMAN ISERSON** and **MAURICE E. MILVILLE** as research chemists at its Whitemarsh Research Laboratories has been announced by Dr. W. A. LaLande, Jr., director of research and development, Pennsylvania Salt Manufacturing Co., Philadelphia 7, Pennsylvania.

GEORGE BLACK, formerly associated with The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., has joined Cooper Alloy Foundry, Hillside, N. J., as manager of the public relations department.

RALPH M. HOFFMAN, president of the Link-Belt Company, Pacific Division, San Francisco, has been elected a vice president of the parent Link-Belt Company in Chicago.

ARTHUR E. KIMBALL, Chicago zone sales manager for related products of the Minnesota Mining & Manufacturing Co., St. Paul, Minn., has been promoted to manager of development and sales for heavy grinding products in the company's abrasives division.

Kennametal Inc., Latrobe, Pa., has announced the appointment of **JOHN A. STORRS** as sales representative in the New York district. Mr. Storrs will work out of the Kennametal office at 6 West Broadway, New York.

S. C. LAWSON, assistant general sales manager of Ampco Metal, Inc., Milwaukee, Wis., has been appointed general sales manager, succeeding **R. J. THOMPSON** who will be located in California where he will serve as engineering and sales manager for Ampco's West Coast activities. **J. P. HENRY,** former Eastern zone manager, succeeds Mr. Lawson as assistant general sales manager. **E. E. WHITSON,** Philadelphia district manager, has been named advertising manager. Other changes in the sales organization of Ampco include the transfer of **J. E. COOK** from Cincinnati to Philadelphia as district manager; **F. A. BURNETT** from Indianapolis to Cincinnati as district manager; and **W. F. TAFF** from sales engineer in the Indianapolis district to manager of that district.

YOUR SIGNAL!

9 - 8 - 7 - 0

Clear Metal Lacquer

... FOR ...

SILVER, CADMIUM, ZINC, COPPER, BRASS, ALUMINUM

Outstanding

1. **Adhesion to metal surfaces**
2. **Resistance to sulfur tarnish**
3. **Resistance to oxidation**
4. **Resistance to perspiration**
5. **Resistance to abrasion**

Pale in color. Takes 100-200% reduction. Dries under 15 minutes.

A premium product—priced at ordinary lacquer levels.

The Varnish Products Company

5208 Harvard Avenue Cleveland, Ohio

HONORS

R. H. HORSBURGH, vice chairman of the board of The Glidden Co., Cleveland, Ohio, was honored recently upon his retirement after 50 years in business, 31 of which were spent with Glidden.

Mr. Horsburgh began his career in 1898 with the Sherwin-Williams Company, and in 1917 he was one of a group of associates who aided in organizing The Glidden Company. He will remain a director of the company and will make occasional visits of inspection to many of the Glidden plants located throughout the country.

Officers and directors of The Glidden Company recently honored **DAVID N. BURRUSS, JR.,** director of engineering, in recognition of his 25 years' service to the company.

You can produce on any material the following surface finishes:

FELT - SUEDE LEATHER - MOHAIR VELOUR - VELVET - CARPET

FUNCTIONAL USES

Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for surfacing all sorts of materials to provide

TEMPERATURE INSULATION • SOUND DEADENING • INTEGRAL GASKETS • SHOCK ABSORBING SURFACE • NON-MAR SURFACE • NON-GLARE SURFACE

DECORATIVE USES

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

FURNITURE UPHOLSTERY • SUEDE LEATHER • INTERIOR AND DRAPERY FABRICS • VELVET • VELOUR • MOHAIR • CARPET

with these patented and trademarked Rayco specialties:

FELT AND SUEDE SURFACE

*"Raymix"—a flock of rayon fibres, trademarked under U. S. No. 427949 to produce a suede effect of utmost realism on any surface.

*"Kingcote"—a cotton flock trademarked under U. S. No. 423572, producing a suede effect at minimum cost.

MOHAIR, VELOUR AND VELVET SURFACE

"Raycote"—a flock composed of uniformly cut rayon fibres to produce on any surface a pile effect such as velvet, plush, or velour. Made under U. S. Patent No. 2014947.

SYNTHETIC CARPET

"Harecote"—a flock composed of animal fibres, produces a durable carpet or rug material.

Request Free Color Card of Actual Samples

**Rayon Processing Co. of R. I., Inc.*

**Registered Trademark*

PIONEER PRODUCERS OF SURFACE COATING FLOCKS

65 MOSHASSUCK STREET • PAWTUCKET, R. I.

POLLAK PAINT CO.
715 Main St.
Buffalo, N. Y.

LAMBERT-NEW ENGLAND CO.
79 Sudbury St.
Boston, Mass.

H. R. MEININGER CO.
409 16th St.
Denver, Colo.

J. GORDON SMITH CO.
3901 Main St.
Dallas, Texas

Mr. Burruss joined Glidden's Chemical and Pigment Division in 1923 and served as manager of the division's Collinsville, Illinois plant and as vice president of a Glidden subsidiary — the Southern Pine Chemical Company. He was general manager of the company's Metals Refining Company division prior to his appointment as director of engineering last November.

MEETINGS

The **NEWARK BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** will hold its Annual Educational Session and Christmas Party at the Hotel Robert Treat, Newark, N. J., December 18, 1948. The Educational Session will begin at 2 p.m. and the banquet at 7 p.m.

The speakers and their subjects are as follows: A. W. Logozzo, Nutmeg Chrome Corporation, "Bright Nickel and Decorative Chrome Problems"; F. Oplinger, E. I. du Pont de Nemours and Company, "Copper Plating"; and Dr. E. M. Wise, The International Nickel Company, "Plating of Precious Metals."

THE AMERICAN WASHER AND IRONER MANUFACTURERS' ASSOCIATION has announced its annual meeting to be held at the Morrison Hotel, Chicago, January 4, the opening week of the Chicago Winter Market. There will be a morning and afternoon session and banquet, all in the Terrace Casino, preceded by an executive committee meeting at the hotel on the afternoon and evening of January 3. Roy A. Bradt, vice president of the Maytag Co., Newton, Iowa, is president of the Association.

The **CHICAGO BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** will hold its annual educational session and banquet on January 15, 1949, at the Stevens Hotel.

The speakers and their subjects will be: Dr. H. J. McDonald, Illinois Institute of Technology, "Corrosion: Enemy of the Plating Industry"; Myron B. Diggin, Hanson-Van Winkle-Munning Company, "Leveling of Electrodeposits"; Dr. H. L. Kelner, Lea Manufacturing Company, "The Evaluation of Polished Surfaces"; and William Phillips, General Motors Corporation, "Deep Sea Diving in a Plating Cell."

SOCIETIES

The newly-formed Utah Chapter of the **AMERICAN SOCIETY FOR METALS** recently became the seventy-seventh chapter to join the national organization.

Elected chairman of the chapter was W. C. Dyer, superintendent, metallurgical, chemical and inspection department, Geneva Steel Company. Don Rosenblatt, chief metallurgist, American Foundry & Machine Company, was chosen vice-chairman, and Dr. H. Edward Flanders, professor of metallurgy, University of Utah, was named secretary-treasurer.

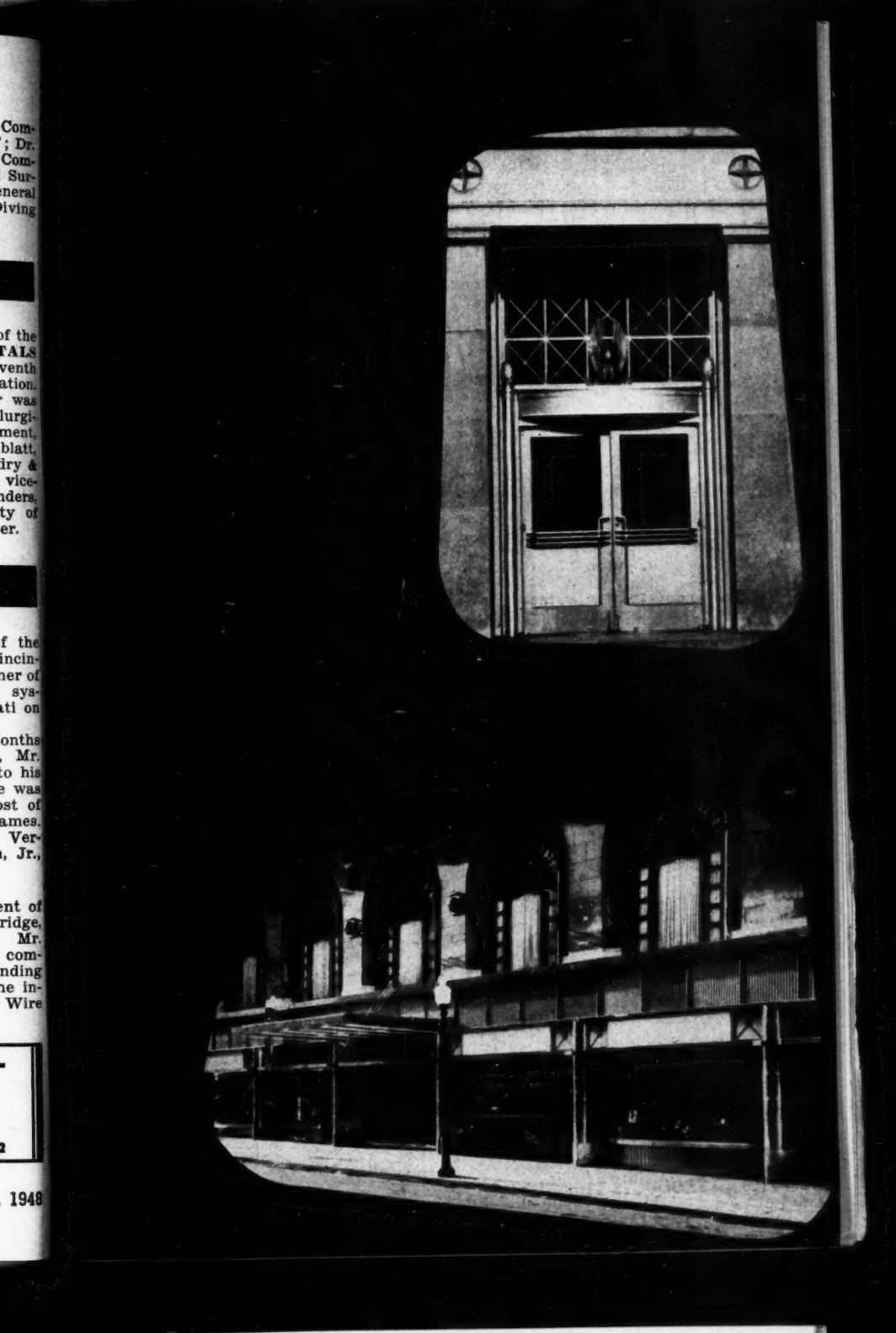
NECROLOGY

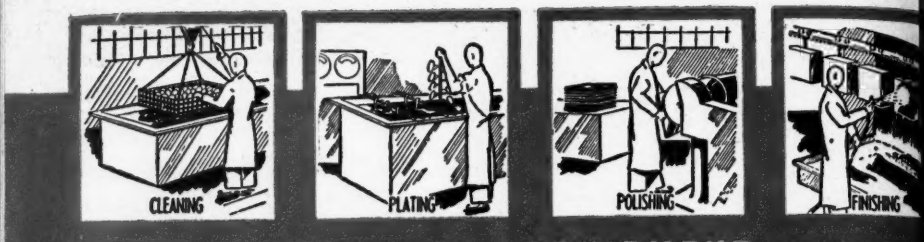
R. J. BLUM, SR., co-founder of the Kirk & Blum Manufacturing Co., Cincinnati, Ohio, manufacturer and designer of dust-collecting and fume-removal systems, died at his home in Cincinnati on Monday, October 18, 1948.

Going into semi-retirement 18 months ago because of a heart ailment, Mr. Blum still made occasional visits to his business. His tall and husky figure was a familiar sight to employees, most of whom he could call by their first names. Surviving him are his widow, Mrs. Verena L. Blum, and son, R. J. Blum, Jr., vice president of the company.

ROBERT W. PINK, vice president of Cambridge Wire Cloth Co., Cambridge, Md., died Tuesday, November 23. Mr. Pink had been associated with the company as vice president since its founding and was a well-known figure in the industries served by the Cambridge Wire Cloth Company.

★ **GUARANTEED INSULATED PLATING RACKS —**
Plus REDDY-RACK replaceable workholder feature.
Quick delivery. Write, wire or 'phone
NATIONAL RACK COMPANY, INC.
22-06 Morlot Avenue, Fair Lawn, N. J. **Tel. Fair Lawn 6-3312**





New • EQUIPMENT • MATERIALS • PROCESSES

Britex

A new liquid compound, called Britex, to be used in alkaline cleaning solutions has been announced by the All-Brite Chemical Co., Main St., Oakville, Connecticut.

The manufacturer claims that Britex, added to the cleaner solution in very small quantities, rejuvenates and prolongs the life of the cleaner, regardless of the metal being cleaned and the brand of cleaner being used. Britex may be used without risk of damage to any cleaning solution, it is stated, and is especially recommended for aluminum cleaners, or cleaners used prior to bright nickel.

Circo Stainless Degreaser

Circo Products Co., 12119 Berea Rd., Cleveland, Ohio, announces a new automatic, push-button controlled vapor degreaser, on which all surfaces exposed to solvent vapors are protected by stainless steel. Many other improvements are incorporated in the Circo Degreaser, built and designed to meet all types of degreasing needs in industry.

In addition to the stainless steel protection and automatic operating controls, the Circo Degreaser features: (1) a built-in reservoir tank for liquid solvent flushing and for automatically restoring solvent to proper operating level in the tank as well as conserving valuable shop space; (2) large, readily removable leakproof clean-out door which makes cleaning of the tank easier and quicker; (3) elimination of moving parts, to assure

Circo Stainless Degreaser

trouble-free operation at lowest possible maintenance cost; and (4) push-button controls which have indicating lights, and a temperature gage to show operating condition of the degreaser.

Perfection Greaseless Compound

A glue base abrasive composition which can be applied directly to a cloth revolving buff has been announced by The Roberts Rouge Co., Stratford, Conn. After application, the water present in the composition dries out, leaving the glue and abrasive particles to perform the cutting or coloring operation. Thus, the buff simulates a flexible head polishing wheel which is readily adaptable for many polishing operations and for producing bright and satin finishes. The work is left clean and dry, it is claimed.

The efficiency of the flexible polishing head is maintained by again applying Perfection Greaseless Compound to the buff when the previous head has been worn down. At the start of the operation, it is recommended that the glue be given a half minute after application to set up properly. Shutting off the power while applying the compound will effect a better polishing head and also cut down on loss of compound.

It is suggested that Perfection Greaseless Compound be stored at a temperature of 10 deg. F. to effect substantial savings and increased polishing efficiency in its use.

"Liquid Stainless Steel"

With a new product called "Liquid Stainless Steel," developed by the Plastics Division, The Lockrey Co., College Point, N. Y., it is now said to be possible to apply a coating of pure stainless steel to any surface by brushing or spraying in much the same manner as a coat of paint would be applied.

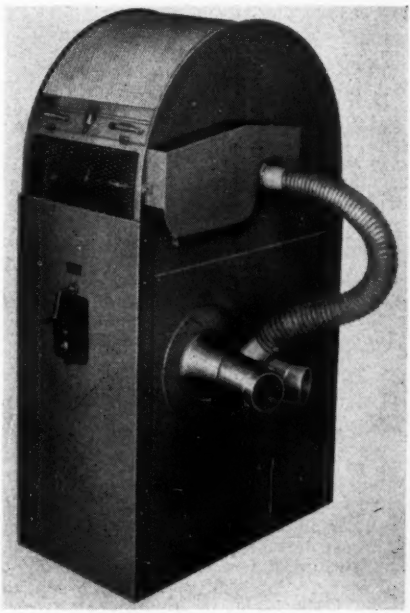
By a new process, stainless steel is broken down into flakes of microscopic size, and this material is incorporated in a liquid plastic and solvent to bring it to brushing consistency. The plastic is said to be waterproof, chemical-proof and fireproof so that the resulting coat approaches the long-looked-for "permanent finish," combining the beauty and durability of stainless steel with the water and chemical resistance and easy cleanability of plastics.

Liquid Stainless Steel exhibits good adhesion to both wood and metal, as well as other finishes, and is quick-drying.

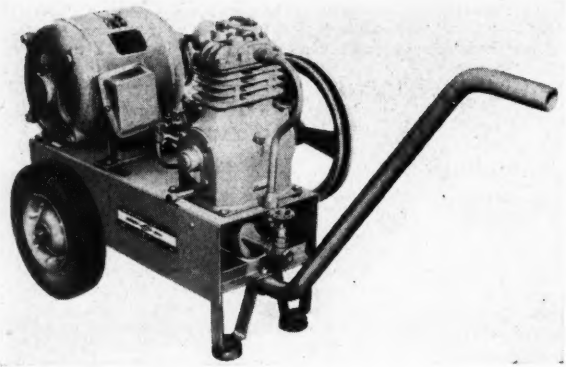
Dustkop Automatic Filter Cleaner Unit

Designed to maintain initial suction, reduce filter replacement, and eliminate manual filter shakedown for heavy-duty buffing operations, an entirely self-contained automatic filter cleaner unit for use in connection with its standard Model 1150 Dustkop Dust Collector has been announced by the Aget-Detroit Co., 577 Main St., Ann Arbor, Mich. A motor-driven reciprocating nozzle continuously sweeps inside the semi-circular filter, returning matted lint to the cyclone where it is removed from the air stream.

Installation of the Dustkop Automatic Filter Cleaner Unit, which can be used with either existing or new model Dustkops, consists simply of removing the old filter assemby and placing the new automatic filter cleaner unit in position.



Dustkop Automatic Filter Cleaner Unit



Black Arrow Air Compressor

Black Arrow Air Compressor

The Black Manufacturing Co., Baltimore, Md., maker of Black Arrow paint spray equipment, announces the addition to its complete line of air compressors of a portable compressor. The compressor is available in two models, one for use with motors ranging from ⅓ to ½ h.p., and the other for use with motors ranging from ½ to 1½ horsepower.

Porcelainite

Porcelainite, a protective coating widely used on such items as metal, ceramics, and glass, and applicable by means of spraying, dipping, or rollercoating, has been announced by the United Lacquer Mfg. Corp., Linden, N. J. Porcelainite provides a one-coat finish and may be baked at 420 deg. F. for 20 minutes. This comparatively low curing temperature is said to make possible the application of porcelain-like finishes on alloys which cannot be baked at high temperatures.

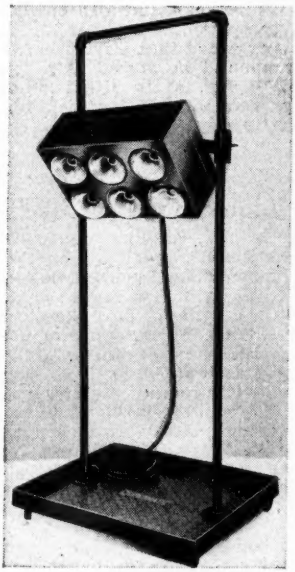
New "Carbomatic" Infra-Red Portable Unit

The Carbomatic Corp., Infra-Red Division, 24-81 47th St., Long Island City 3, N. Y., manufacturer of electric and gas-fired infra-red equipment, announces a new improved portable electric unit.

The new all-steel electrically-welded stand is designed to give rigid support to the reflector box (which is movable, upward and downward, through a full arc), and to allow greater flexibility in use—whether the unit is employed singly or as a battery to form banks or tunnels. Greater accuracy and stability thus are afforded in the positioning of the unit for heat processing applications such as drying (including paint drying), baking, dehydrating, and heating.

The aluminum reflector box itself is equipped with improved new lamps, resistant to sudden heat changes and to moisture. These infra-red lamps are devised to ensure safer operation and uninterrupted production for the user.

Another feature is the convenient steel tray, which is an integral part of the stand. Materials may be placed on the tray and dried or baked with the reflector in the inverted downward position. The tray is mounted on ball-bearing swivel casters for complete mobility.

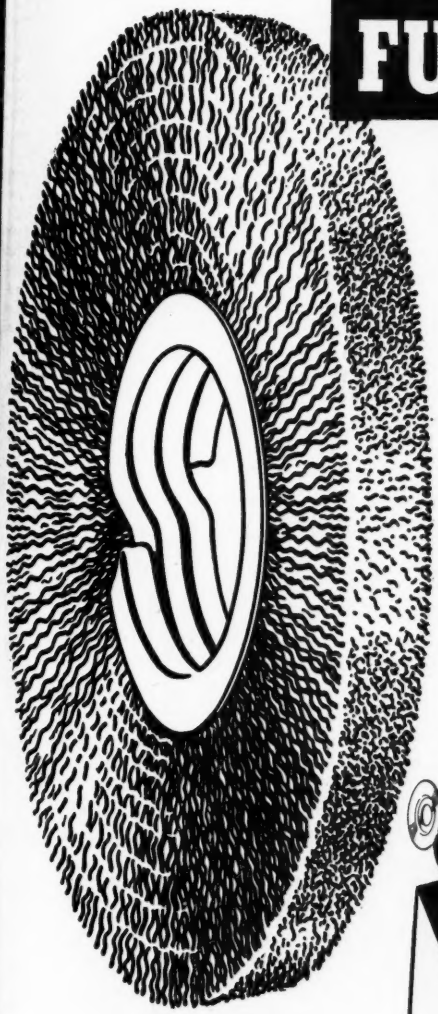


New "Carbomatic" Infra-Red Portable Unit

Easy Installation
Economical Replacement

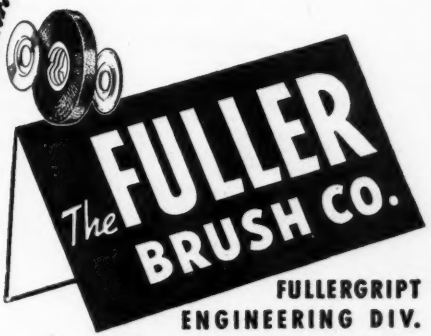
FULLERDISC

WHEEL BRUSHES



Combination adapter side plates make Fullerdisc wheel brushes easy to install. Quick, too. The same combination is also responsible for cutting costs because *only* the brush section need be replaced. You buy side plates just *once.*

Fullerdiscs are adapted to fit shafts from ½″ to 1″. Brush diameters range from 5″ to 9″ in a choice of materials. For complete specifications send for new folder "Fullerdisc Wheel Brushes". Write today to . . .

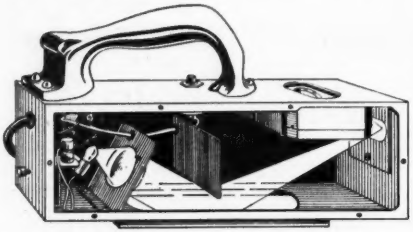


FULLERGRIPT ENGINEERING DIV.

3626 MAIN ST., HARTFORD 2, CONN.

New Portable Glossmeter and Reflectometer

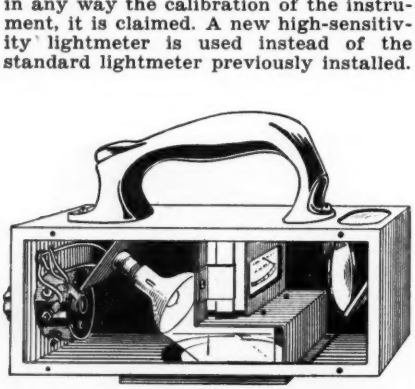
A new portable 60 deg. glossmeter and a companion portable reflectometer are now available from the Henry A. Gard-



Cutaway view of interior of the portable 60 deg. Glossmeter showing the prefocus base lamp, the single Conza lens, and sensitive lightmeter in the instrument

ner Laboratory, Inc, 4723 Elm St., Bethesda 14, Md. The new instruments have been designed to fill the need of many laboratories for simple, rugged, and inexpensive apparatus which will take reflectance and gloss measurements.

In the diagram of the new glossmeter, it will be seen that a lens and firmly positioned lamp are used in place of the flashlight unit of the old model of this instrument. With the new instrument a lamp may be changed without changing in any way the calibration of the instrument, it is claimed. A new high-sensitivity lightmeter is used instead of the standard lightmeter previously installed.

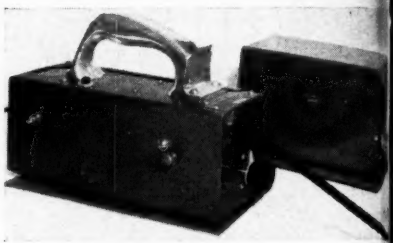


Cutaway view of interior of 45 deg., 0 deg. reflectometer showing lamp and reflector, lightmeter with illuminated scale, reading lens and mirror

The high-sensitivity lightmeter is al employed in the portable 45 deg., 0 de reflectometer. Reflectometers are n sensitive, like glossmeters, to slig changes of the geometric pattern of th incident beam of light; therefore, th flashlight lamp and reflector have be used in this instrument to provide a lar amount of incident illumination. A ph tocell-correction filter is employed that reflectance values for colored su faces are measured accurately.

The same power supplies are used f both instruments; either (1) 110-volt a (2) battery in carrying case, or (3) du unit for operation from either type power. Both instruments are accura to approximately plus or minus 2 per cen it is claimed.

The glossmeter measures 60 deg. spe ular gloss according to Procedure C ASTM Method D523-447 for the specula gloss of paint finishes. On this scale glossy finish measures more than 70, a eggshell finish between 30 and 6, a fla finish less than 3.



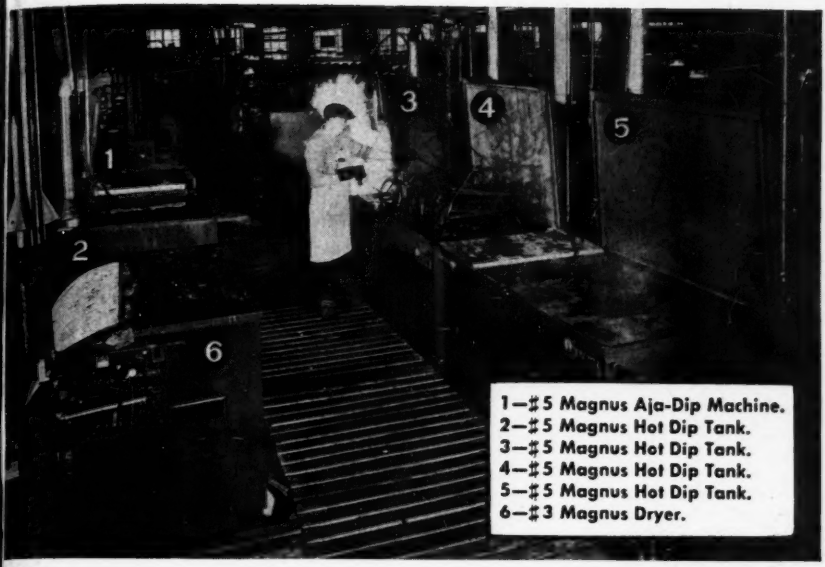
Portable reflectometer

The reflectometer measures 45 deg. deg. luminous directional reflectance a cording to ASTM Method D771-47. this scale whites measure 60 to 90 more; light grays, yellows and past colors, 25 to 60; dark grays and colors, to 25; and blacks, less than 3.

Two working standards of differe value are supplied with each instrume so the user may be assured at all time of the accuracy of his instrument.

Viscoclear

United Lacquer Mfg. Corp., Linde N. J., announces the development of clear lacquer known as Viscoclear, whic is made in a high gloss, semi-gloss, an off-flat sheen.



1—#5 Magnus Aja-Dip Machine.
2—#5 Magnus Hot Dip Tank.
3—#5 Magnus Hot Dip Tank.
4—#5 Magnus Hot Dip Tank.
5—#5 Magnus Hot Dip Tank.
6—#3 Magnus Dryer.

10 TIMES THE OUTPUT AT HALF THE COST

THIS plant used to employ vapor degreasing to remove oil and drawing compounds from parts used in making wrenches, shears, hammers, etc.

Then they equipped their cleaning department with a #5 Magnus Aja-Dip Machine, four #5 Magnus Hot Dip Tanks and one #3 Magnus Dryer to get faster, better cleaning. Magnus Cleaner 94XX is the chemical used.

Production is 10 times greater than before the Magnus method—and parts are cleaner, with no hand work necessary. They have vastly improved working conditions, *with no toxic fumes*. They report 50% savings in material and labor.

Magnus Machines, with suitable Magnus Cleaners, can cut costs and boost production for you, too. Ask us to show you how!

MAGNUS CHEMICAL COMPANY • 208 South Ave., Garwood, N. J.

In Canada—Magnus Chemicals, Ltd., 4040 Rue Masson, Montreal 36, Que.

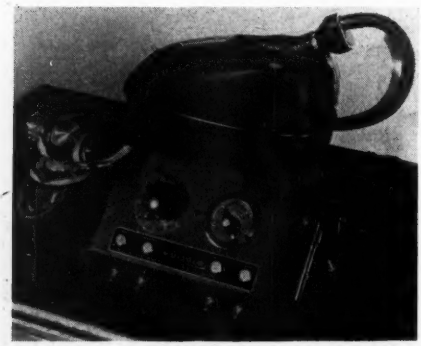
Service representatives in principal cities

Viscoclear has a solid content which closely approximates that of varnish and is said to possess rapid build and low viscosity, which permit the lacquer to be applied without the addition of thinner. It is recommended for use where unusual resistance to cold checking and mar resistance are desired.

Taber Model No. 100-109 Abrasion Testing Set

Announced by the Taber Instrument Corp., 115 Goundry St., North Tonawanda, N. Y., the Model No. 100-109 is a new abrasion testing set in the Taber line of standard rub-wear abrasion testers. The wear results from alternately rubbing the flat faces of two resilient Calibrase wheels over the surface being tested. A range of standardized abrasive wheels is available for testing all types of surface finishes, including electroplate, porcelain enamel, organic coatings, leather, glass, plastics, and woven textile fabrics. This tester is the result of 12 years' experience in building various types of abrasion testing equipment.

New Abraser features include improved suction pump and vertical dust receiver with swinging nozzle fully adjustable for any thickness specimen. Different materials require a varying degree of suction cleaning while being tested; therefore, the control unit is equipped with a built-in variable transformer for adjusting the speed of the suction turbine motor. The control panel is also equipped with an adjustable timer to provide a test period



Taber Model No. 100-109 Abrasion Testing Set

Dremel "Moto-Sander"

of 1,000 cycles or less, and then to au matically shut off the power.

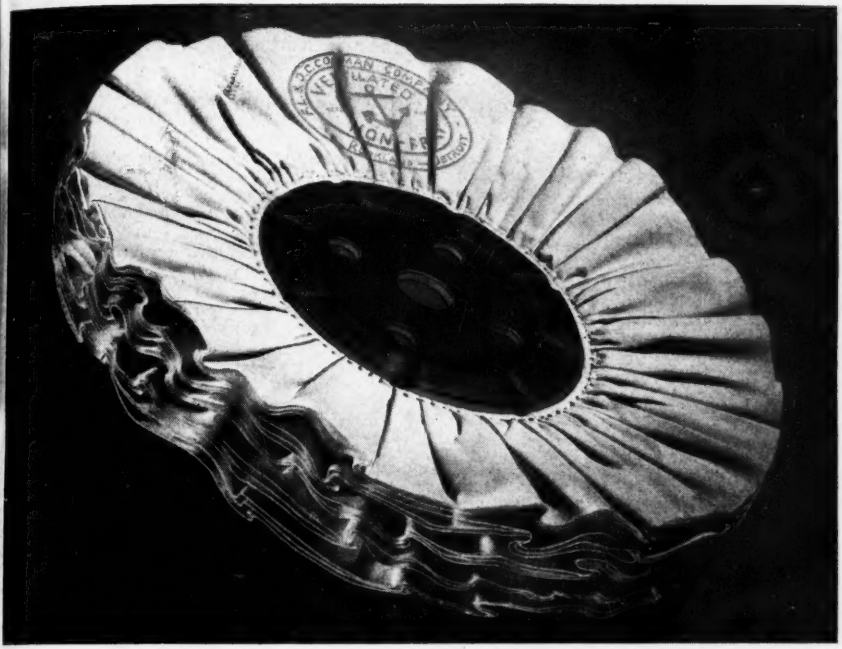
Switches on the front of the cont panel provide any combination of oper ing conditions, such as with or with vacuum pickup, continuous operati without timer, or timing up to 15 minut

An important feature of Model No. 1 109 is that the control unit is equipp for dual operation; that is, an addition Abraser unit can be located beside a connected with the control unit, there permitting two specimens to be test simultaneously using the same contr and vacuum unit.

Dremel "Moto-Sander"

The Dremel Mfg. Co., Racine Wis., h announced the development of a co bination electric sander and polisher be known as the "Moto-Sander." Co pactly made, thus enabling it to be us in close quarters and other hard-to-g at places, the tool weighs 2½ lb. and equipped with a rubber-cushioned san ing pad which measures 2¼ x 5½ inch

According to the manufacturer, t Moto-Sander has only two moving par and never requires oiling or adjustmen Designed to operate quietly on 110-1 volts, 60-cycle a.c., the unit is construct to oscillate at approximately 7,200 stro per minute, the short rapid strokes re ily freeing the sandpaper of excessi dust and particles, it is claimed. A ca type clamp holder permits rapid chang of sandpaper.



"A Real Producer"

*The *Real-Vent*

NON-FRAY VENTILATED BUFF

MANUFACTURERS — Here is a harder-working, longer-lasting buff! Production records, where this buff is now in use, prove that the REAL-VENT is the best for the money you have ever used. The REAL-VENT is the result of CODMAN'S 50 years of constant study at first hand of the finishing problems of manufacturers in many fields.

Don't miss getting the full details on REAL-VENT'S revolutionary thin-center and deep-ventilating-channel construction.

WRITE OR WIRE FOR DETAILS TODAY!

CODMAN
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Philadelphia
Grand Rapids

* Made Under Patent Numbers 2,027,863; 2,094,650; 1,573,961; Re. 19,894; 2,140,208. Other Patents Pending.

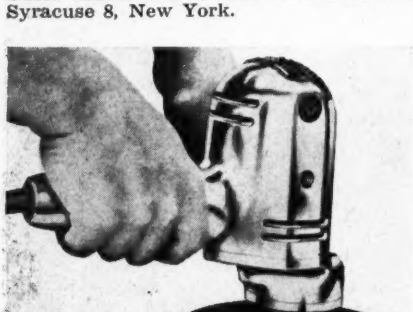
THE MARK OF QUALITY

Over 50 Years the Greatest Name in Buffs

F.L.&J.C.
CODMAN
COMPANY
ROCKLAND · MASSACHUSETTS

D-6 Electric Polisher

A powerful, multi-purpose tool, the D-6, has been announced by the Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, New York.



D-6 Electric Polisher

Especially designed for tough jobs in industry, the D-6 will grind, polish, drill, and cut by a simple change of attachments. A stiff 7-inch disc, infused with silicon carbide grit, is used edgewise to cut through steel and other ferrous and non-ferrous metals. By attaching a disc, welds can be blended, large surfaces ground down, castings deburred, and brass and other metals may be polished. By attaching a buff these surfaces may be polished to a high luster.

A guide grip can be attached to either side of the machine for left or right-handed operators, or it can be removed entirely for use in limited spaces.

Specifications are: motor, universal 115 volts d.c.-a.c., 25-60 cycle, single phase; spindle, ⅝ inch-11 thread with ¼-inch hex socket in end; speed (approximately), 3,000 r.p.m. no load, 2,000 r.p.m. normal load; overall dimensions, 7⅜ inches high x 7 1/16 inches wide x 11⅛ inches long; net weight, 5 lb., 13 ounces.

18-8 Stainless Steel Pigment

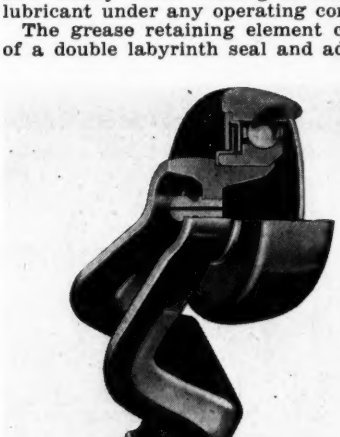
The corrosion resistant properties of 18-8 Type 302 stainless steel can now be secured by the application of paint. Product of Charles Hardy, Inc., 420 Lexington Ave., New York 17, N. Y., 18-8 Stainless Steel Pigment is now available for interior and exterior finishing. The finished surface is silver gray in appearance with the bluish cast of stainless steel.

The pigment is an 18-8, Type 302, stainless steel flake of 100 per cent minus 20 mesh with 85 per cent minus 325 mesh. The "Dry Flake" contains approximately 1 per cent stearic acid as a leafing medium. The "Paste" contains approximately 25 per cent Varsol as the paste forming agent. When properly wet and mixed, it exhibits good leafing properties in most vehicles; however, best appearance is obtained with thin fast drying vehicles.

Webb Overhead Trolley Conveyor Wheel Grease Seal

The Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich., has designed a new trolley wheel bearing to retain the lubricant under any operating condition.

The grease retaining element consists of a double labyrinth seal and adequate



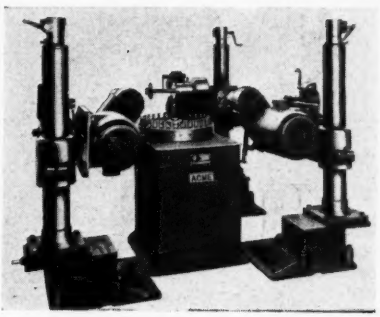
Webb Overhead Trolley Conveyor Wheel Grease Seal

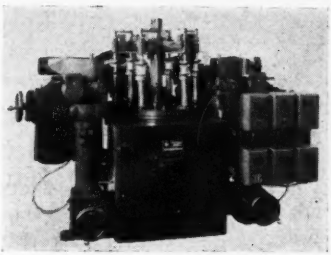
lubricant cavity. Grease is introduced through the lubrication fitting in the hub. Space under the wheel cover provides an ample storage cavity. Lubricant easily

• FOR HIGH PRODUCTION POLISHING AND BUFFING •

ROTARY AUTOMATICS • SEMI-AUTOMATICS • STRAIGHT LINE AUTOMATICS

ACME *Small Rotary* Polishing *and* Buffing Machines





- ***Above: Acme Type LC-20 continuous rotary having 20 to 30 continuous revolving spindles which remain idle at unloading and loading stations. This unit has 3 Acme type G-3 adjustable floating head lathes.***
- ***Right: 30" Acme Rotary, 6 station indexing machine equipped with 4 adjustable floating head and adjustable tail stock arrangement.***

ACME small indexing and continuous rotaries have demonstrated their efficiency in cutting costs on many types of high production polishing and buffing jobs in many plants.

These machines can be furnished in many standard table sizes and indexing stations depending upon the number of polishing and buffing heads required.

The ACME type G-3 head may be converted to utilize polishing belts with stationary or floating back up wheel.

Acme Automatics and Semi-Automatics can do a big job in many plants by replacing low production, high cost man-hours with high production, low cost machine-hours.

It may pay you to investigate!

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

ACME *Manufacturing Co.*

1645 HOWARD ST. DETROIT 16, MICH.

Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS

travels into the anti-friction bearing, but is prevented from escaping by the double labyrinth.

The outside flange of the hub provides a protected recess for the grease fitting which avoids the possibility of fittings being knocked off by handling or broken where the trolley must pass close clearances.

"LEAtardent"

The Lea Manufacturing Co., Waterbury 86, Conn., manufacturer of finishing and plating supplies, has introduced "LEAtardent," a protecting solution used in the plating shop to prevent water staining and tarnishing of nickel plated work, brass work and, to some extent, copper prior to operations such as lacquering, plating, assembling, and so on.

LEAtardent is a liquid of about the color and consistency of milk and is used either full strength or diluted with three parts of water as a final dip for the work. After being dipped in LEAtardent, work may be rinsed in hot or cold water and dried at a temperature not exceeding 140 deg. Fahrenheit.

J.K.L. All-Purpose Scraper

Said to be ideal for scraping paint spray booths and floors, as well as for numerous other scraping operations, an all-purpose scraper with replaceable blade is now being produced by the J.K.L. Manufacturing Co., 1120 11th Ave., Rockford, Ill. The scraper consists of a 48-inch long grain wood handle to the end of which is attached a heavy gauge welded steel blade holder having three hardened bolts, nuts, and washers for locking the blade in position.

ALLWOOD

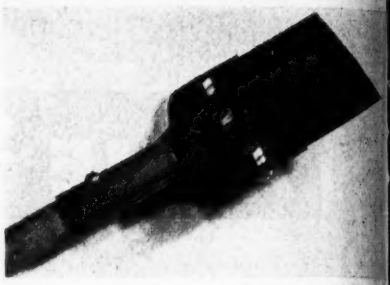
"Vienna Brand" Lime

Made from Limestone that is identical in chemical analysis and geological structure with European Imported Lime. Tests show a "lime cake" made from Allwood "Vienna Brand" Lime equals the finish made from imported lime.

WRITE FOR FULL PARTICULARS

ALLWOOD LIME COMPANY

Manitowoc • Wisconsin



J.K.L. All-Purpose Scraper

The blade is made of high grade too steel which is tempered for long wear According to the manufacturer, the blad is designed to hug the floor surface an is made with slots which prevent rock ing or tipping of the blade in the holde when in use. When used on wood floors the scraping edge is ground square. Fo all other purposes, the blade is groun with a double bevel. The standard blad has a 6-inch cutting edge. A blade wit an 8-inch edge can also be furnished Where inflammable debris or an explo sive atmosphere is present, brass blades can be supplied which may be safely used without danger of sparks, it is claimed.

Matawan Cleaners

The Hanson-Van Winkle-Munning Co. Matawan, N. J., announces the addition to its line of the following new cleaners:

Matawan No. 20-W is a mild non-etching cleaner containing a synthetic wetting agent and a water softener. Used primarily as a soak cleaner for aluminum it will not etch the surface. It is also said to be excellent for cleaning zinc base die castings and brass parts.

Matawan No. 20-X is a mild non-etching alkaline cleaner containing a cresylic base which aids in the stripping of paint and heavy oil films from aluminum. It is used as a paint stripper on aluminum or as a soak cleaner for aluminum parts.

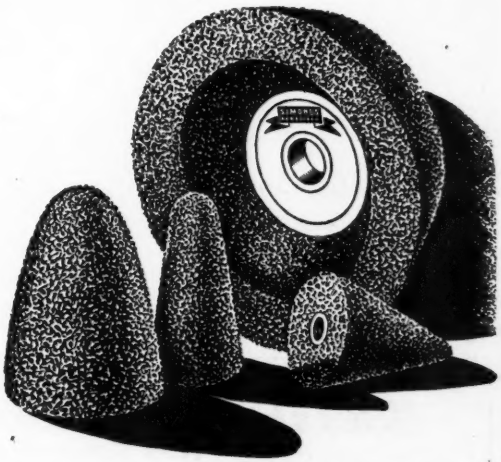
Matawan No. 25 is a non-silicated medium caustic base specially designed for the etching of aluminum where the presence of a silicate would inhibit the desired etching action. It is recommended as a soak solution for etching aluminum.

Matawan No. 30 is a silicated medium caustic base cleaner containing no foam-

SIMONDS
ABRASIVE CO.
PHILADELPHIA, PA.

GRINDING WHEELS

For better and faster weld grinding specify Simonds Abrasive Wheels—resinoid bonded for high speed grinders—vitrified bonded for regular speeds. For all your grinding wheel needs consult your local Simonds Abrasive distributor.



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Simonds Products for Canada

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

ing or wetting agent. Its application is said to be principally in spray type washing machines for steel parts where its water softening ability tends to keep the machine and jets free of lime scale. Where the presence of foaming agents in the tank is detrimental to the cleaning process, Matawan No. 30 may also be used as a direct or reverse electrocleaner.

Matawan No. 30-W is a silicated medium caustic base cleaner containing a suitable wetting agent, claimed to be ideal for the job shop operator because it can be used on iron, steel, brass, or bronze as a soak or as an electrocleaner, anodically or cathodically. It can also be used as an anodic die cast cleaner.

Matawan No. 45, on which the 45 Series Cleaners are built, is said to contain no free caustic but a more effective combined form of caustic which provides long life and resistance to breakdown. The cleaner is recommended for medium or heavy duty cleaning of iron and steel.

Matawan No. 45-W contains a stable wetting agent and is recommended for use with either direct or reverse current or as a soak cleaner for cleaning iron and steel.

Matawan No. 45-F contains a free rinsing rosin soap and is recommended for use in soak tank cleaning.

Matawan No. 50-W is a non-silicated high caustic content type cleaner containing a wetting agent. The main usage is said to be as a soak solution for the cleaning of magnesium.

Matawan No. 65-IM is a cleaner designed for extra heavy duty cleaning of steel. The cleaner is said to contain a combined form of caustic and a stable wetting agent so that it may be used effectively for reverse current cleaning of steel and cast iron.

New Hand Cleaner Dispenser

The Magnus Chemical Co., Inc,. Dept. PF, Garwood, N. J., manufacturer of industrial cleaning materials and machines, now offers its powdered hand cleaner in attractive, handy five-pound containers for easy dispensing.

The new package, an easy-to-carry size

New Hand Cleaner Dispenser

provided with a pouring spout, is designe for use in connection with wall-mounte powdered hand cleaner dispensing unit

The following grades of Magnus Han Cleaner are available in the new co tainer: heavy duty; medium; and supe fine. Magnus Hand Cleaner has been favorite in garages and industrial plan for nearly 28 years as a safe, quick, an economical method of removing greas paint, pitch, ink, and all other hard-t remove dirts and stains from the hand

New Small Parts Chromium Plating Process

The Midwest Chrome Process Co., W. Milwaukee Ave., Detroit 2, Mich., an nounces a new process for chromiu plating small parts such as screw rivets, screw machines parts, stamping and so on.

It is stated that parts are processed i bulk—without racking—throughout th entire plating cycle. The chromium coat ings produced by the bulk process ar bright, lustrous, and comparable wit buffed chromium finishes, it is claimed

For a real good polishing job use
Keystone TURKISH Emery
FRESH SUPPLY AVAILABLE
KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Sel-Rex Style 5009 Selenium Rectifier

Designed to fill the need for an economical direct current power source for requirements up to 5,000 amperes with varying voltages from 1 to 9 volts, the Sel-Rex Style 5009 Selenium Rectifier, manufactured by the Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y., is recommended for chromium, bright nickel, and acid copper plating, as well as electrocleaning and electropolishing.

The Sel-Rex Style 5009 Selenium Rectiger is 78 inches high x 45 inches wide x 40 inches deep, and has an input of 200-220-440 volts, 3-phase 60-cycle. Outstanding features claimed for the unit include: full load efficiency of 72 per cent, increasing to 83 per cent at 20 per cent load; continuous plating control which permits changing tap switch positions without plating interruption; conservatively rated selenium stacks having 310 square inches of rectifying area per 100 amperes and heavily coated for corrosion protection; quiet, efficient fan which requires no external voltage for operation; positive overload protection in d.c. bus circuit for extra safety; primary adjustment taps to compensate for abnormal line voltages; specially engineered heatproof transformer, conservatively rated and designed to withstand high temperatures and corrosive atmosphere; and 60 positions of output adjustment (coarse switch 1 volt per step—fine switch 1/6 volt per step).

Non-Electrolytic Anodizing Process

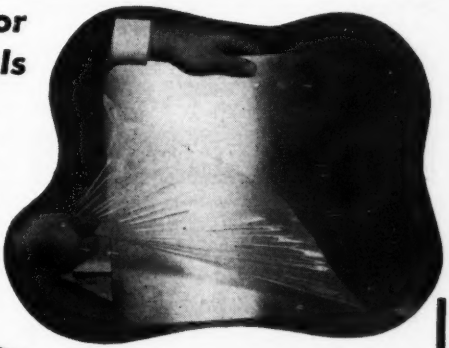
A simple chemical immersion treatment for aluminum alloy No. AL-24 (AN-A-12) and other similar alloys is now available from the Technical Processes Div., Colonial Alloys Co., Philadelphia 29, Pa. Aluminum so treated conforms to Air Force-Navy Specification No. An-C-170.

The processing cycle consists of cleaning, rinsing, immersion anodizing, rinsing, sealing, and rinsing. No electrical equipment is said to be necessary and steel tanks, unlined, may be used.

Production facilities for treating parts by this process have been installed at the plant of the Colonial Alloys Company, and the process is also available on a license basis.

A Strippable Plastic for the Protection of Metals

Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust.



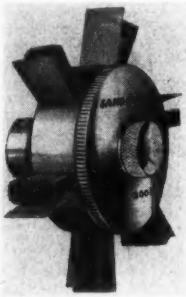
THE STRIPLASTIC COMPANY

Among many advantages, it is nontoxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

10828 QUEBEC AVE.
CLEVELAND 6, OHIO

Sand-O-Flex Model 300D Sander

Merit Products, Inc., 4373 Melrose Ave., Los Angeles 27, Calif., announces its Sand-O-Flex Model 300D Sander, a production tool for finishing small parts too large to be deburred by tumbling.



Sand-O-Flex Model 300D Sander

Sand-O-Flex Model 300D consists of an aluminum body which houses a cartridge of abrasive cloth containing six strands fastened to a single core. As the abrasive wears it unwinds out through the housing in front of six replaceable brushes. When the wheel is rotated, the brushes "cushion" the abrasive and mold it to the work shape.

Abrasive cartridges are available in fine, medium, and coarse grits in aluminum-oxide cloth for metalworking and garnet cloth for woodworking. The shank is bored to fit either a ½ or ⅝-inch shaft. The unit may be used on most portable hand drills, flexible shafts, and motor shafts.

PRODUCT LITERATURE

The publications listed in this section may be obtained free upon written request on company letterhead to the manufacturers concerned. Your courtesy in mentioning PRODUCTS FINISHING when requesting copies of these publications will be sincerely appreciated by the manufacturer and the publisher of this magazine.

Blasto Spray Gun Literature. Information concerning Blasto Dual Spray Gun and its use in spraying various flock materials is being offered by the Blasto Spray Gun Manufacturing Co., 7007 Haas Ave., Los Angeles 44, Calif. Also discussed in the literature are adhesives for flocking, surface preparation for flocking, and the application of flocking materials. The product and process are illustrated by samples of flock and glass glow beads sprayed on the mailing pieces.

"Standard Specialties" is the title of a 24-page two-color catalog published by The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y., which lists approximately 200 standard products made of Monel, nickel, and Inconel for corrosive and high temperature service.

Louric Electro Plater Folder. A folder illustrating and describing the Louric Electro Plater is being distributed by the Louric Manufacturing Co., 1809 Callowhill St., Philadelphia 30, Pa. The folder describes in detail the construction and operation of the Louric portable plating set and suggests many uses for the equipment.

"Woven Wire Conveyor Belts for Industrial Applications." Available from The Cambridge Wire Cloth Co., Cambridge, Md., this 60-page booklet contains a series of articles devoted to detailed discussions of the design, operation, and maintenance of woven wire conveyor belts in industrial applications. The wide range of materials employed in the construction of such belts, the methods used in weaving the different styles, and the number of ways in which woven wire conveyor belts can be installed are described. The booklet is well illustrated throughout and includes a section devoted to actual industrial applications.

Brown pH and Conductivity Recorders and Controllers. The application of pH and conductivity control to different industrial processes is featured in Catalog No. 15-12 being issued by The Brown Instrument Co., Wayne & Roberts Aves., Philadelphia 44, Pa. Typical examples presented include pH control in heavy chemical industries, agricultural chemistry, electroplating, research, steel industries, and so on; and conductivity control in water treatment, power plants, and the textile industry.

Catalog No. 15-12 also offers a discussion of the fundamentals of pH, oxidation-reduction potential and conductivity, and describes various instruments, such as the ElectroniK Potentiometer, Flow Electrode Assembly, the Beckman pH Amplifier, as well as electrodes, conductivity cells, control valves, motors, and pneumatic control accessories.

"One Coat Paste Insulation for Production Racks" is the title of a four-page bulletin being issued by Nelson J. Quinn Co., Toledo 7, Ohio. The bulletin describes the application of Bunatol 1000 paste insulation to plating racks and outlines the advantages of using racks so coated.

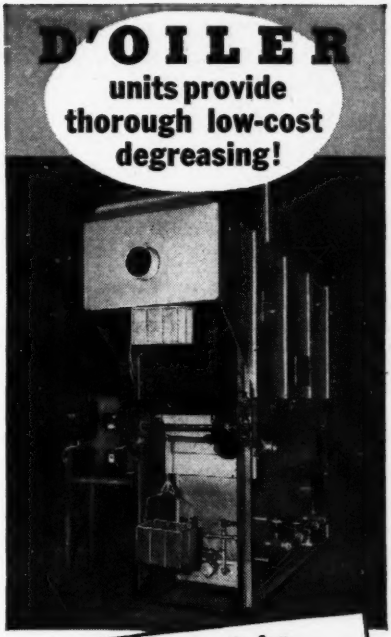
"Hints on Preparing Metal for Painting" is the title of Bulletin 48-60, available from the Neilson Chemical Co., 6561 Benson St., Detroit 7, Mich., which discusses the use of Prep Products for the treatment of aluminum alloys; zinc, lead-coated, and cadmium-plated surfaces; ferrous metals, sheet metal and stampings; and zinc-base die castings.

L&N Pneumatic Control. A complete, air-actuated control system of advanced design is presented in a 24-page well-illustrated catalog now being issued by the Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. The postwar equipment described in this publication is designed to enable users in the oil, chemical, and other industries to obtain faster start-up, smaller process swings, no process drifts, longer on-stream runs, faster recovery from upsets, and shorter turnaround time.

Included in Catalog ND4B is a complete line of L&N controllers, round chart or strip-chart models; Speedomax for regulating temperatures, per cent SO_2, electrolytic conductivity or pH.

"Koppers Industrial Protective Coatings" is the title of a 12-page folder issued by the Tar Products Division, Koppers Co., Inc., Pittsburgh 19, Pa., which provides expert direction on the application of cold-applied protective coatings, especially designed to prevent corrosion and deterioration.

Surface preparation, coating thickness, and methods of application are discussed. The various types of protective coatings made by Koppers for cold application are described in detail, together with information on coverage, primers needed if any, drying time, thinners that can be used, and temperature limits. The folder presents pictures of specific applications, and outlines methods of preventing corrosion caused by industrial atmosphere, chemical fumes, moisture, corrosive soil, and heat.



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Exolon Abrasive Grains are described and illustrated in a six-page, two-color folder issued by The Exolon Co., 943 E. Niagara St., Tonawanda, N. Y. Polishing procedures and recommendations are presented outlining suggested practice applicable to various industry groups.

Cabinet Ovens. The Young Brothers Co., 6500 Mack Ave., Detroit 7, Mich., is now issuing Bulletin 8-S which presents detailed information on electric, gas, or steam-heated laboratory and standard cabinet ovens and also illustrates a group of special cabinet ovens which are adaptable for a large variety of processes.

Torit Dust Collectors, self-contained units for carrying away dust-laden air from grinding, cutting, and polishing wheels, are illustrated and described in Catalog No. 33, currently being distributed by the Torit Manufacturing Co., Walnut and Exchange Sts., St. Paul 2, Minn. Eight typical installations are pictured, and specifications of each unit and a price list of accessories are included.

"Rust-Oleum Stops and Prevents Rust" is the title of a new descriptive catalog issued by Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill., outlining the qualities of the company's laboratory-and-field tested rust preventive products for industrial, railroad, marine, farm, and general uses.

Problems of scientific rust control, together with directions for use and application of Rust-Oleum, are outlined. An index of products in the new enlarged Rust-Oleum line, together with topically listed specifications organized for easy reference through the visual use of 48 color cards, augmented by 22 color panels of machinery and implement finishes, is included.

The Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y., has available an eight-page two-color booklet, **"The Sel-Rex Story,"** which illustrates by means of cartoons the advantages of Sel-Rex selenium rectifiers.

Cadet Grinders, Polishers, and Buffers are illustrated and described in Bulletin 112 now being issued by The Standard Electrical Tool Co., Cincinnati 4, Ohio. A list of complete specifications is included.

"Metal Degreasing with Chlorinated Solvents" is the title of a ten-page illustrated booklet issued by the Chlorine Products Division, Electrochemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. Standard practices to be used in efficient cleaning of metals are outlined in detail and photographs of degreasing machines used for various cleaning cycles are included. Details of degreaser design and installation are enumerated and technical data on solvents are furnished.

"Your Career in the Metallurgical Profession" is the title of a 96-page booklet prepared by John W. W. Sullivan, Sc.D., of the staff of the American Iron and Steel Institute and published and distributed in the interests of the metallurgical profession by the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. The booklet was prepared with the advice and cooperation of the American Society for Metals' Advisory Committee on Metallurgical Education, of which Robert F. Mehl, director of Metals Research Laboratory, Carnegie Institute of Technology, is chairman.

Issued with no commercial purpose other than to emphasize the need for trained metallurgists, the booklet is designed to help high school students decide if they are fitted for and interested in metallurgy as a vocation. School executives have been furnished copies of the booklet.

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Pangborn Bulletin 1400. Pangborn Hydro-Finish Cabinet for deburring, removing and blending directional grinding lines, finishing threaded sections for workability and fit, and general maintenance cleaning is shown and described in a six-page two-color bulletin published by the Pangborn Corp., Hagerstown, Md.

A four-page, two-color folder illustrating and describing **Fibre Glass Super-Heaters,** whose electric units deliver uniform, controlled heat up to 700 deg. F. to speed up industrial processing, is now available from the Sill Paper Company, Inc., Engineering Div., 51 Madison Ave., New York 10, New York.

Wil-Son "Instant-Shape" Portable Infra-Red Oven, adaptable to dry any shape of article and available in sizes from 3 to 10 rows of lamps, is described in **Catalog No. PH-6-91** now being distributed from the Wil-Son Manufacturing Corp., 700 Huston St., Cloverport, Kentucky.

Ducon Centrifugal-Wash Collectors for the economical and efficient control and suppression of dust and fumes are illustrated and described in a four-page two-color bulletin issued by The Ducon Co., 147 E. Second St., Mineola, N. Y. Typical installations of the collectors are shown, and a condensed table of capacities of the various sizes of collectors is included. Copy of Bulletin No. CW-48 free upon request.

Neilson Pre-Paint Treatments. The Neilson Chemical Co., 6564 Benson St., Detroit 7, Mich., now has available the following four-page, two-color bulletins: Alumiprep, a surface treatment for aluminum prior to spot welding or painting; Prep-n-Cote, a cleaning and phosphate-coating process for steel or aluminum to be used in mild steel spray-type washing machines; and Metalprep, a rust remover and metal cleaner for steel, aluminum, or galvanized iron. Specifications and uses are given for each product.

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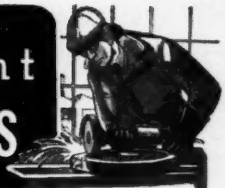

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Abrasion Testing. An illustrated brochure containing technical data and full description of Taber's rotary abrading action is available from the Taber Instrument Corp., 115 Goundry St., North Tonawanda, New York.

"To Give Your Product a Good Start, Give it an Interchem Finish," is the title of a 12-page catalog issued by the Interchemical Corp., 57 State St., Newark 1, N. J., which discusses the company's speed-bake finishes; air-dry enamels; heat-resistant organic finishes; chlorinated rubber base coatings; white drum linings; metal decorating coatings; wrinkle, hammered, aircraft and wood finishes; grain and texture reproductions; universal primer; and special finishes.

Plastic Peel, a strippable plastic coating for metal parts for protection against corrosion and against mechanical damage in shipment and storage, is described in a booklet issued by the Hercules Powder Co., Inc., Wilmington, Delaware.

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Pereco CB-55 Electric Laboratory and Shop Furnace, ready to use, with all the necessary equipment and instruments built-in, is fully discussed and illustrated in a leaflet available from the Pereny Equipment Co., 893 Chambers Rd., Columbus 12, Ohio.

Du Pont Products Index. E. I. du Pont de Nemours & Co., Electrochemicals Dept., Wilmington 98, Del., has issued Products Index E 1-748 listing ceramic, chlorine, electroplating, formaldehyde, peroxygen, sodium, cyanide, and vinyl products.

Hercules Dresinates (water soluble salts of selected rosins) for extra-action alkaline cleaning compounds are discussed in detail in an eight-page booklet distributed by the Hercules Powder Co., Inc., Wilmington, Delaware.

Chlorinated Hydrocarbons. The properties, specifications, and uses of chlorinated hydrocarbons, non-flammable or of moderate flammability, are presented in a bulletin distributed by E. I. du Pont de Nemours & Co., Electrochemicals Dept., Wilmington 98, Del. Listed are the properties and characteristics of three groups—methane, ethylene, and ethane chlorinated hydrocarbons, and included is a graph showing the vapor pressures of hydrocarbons at various temperatures.

Durco Heat Exchanger Packaged Unit Bulletins. Nine descriptive bulletins (Bulletins 1610-1 through 1610-9) describing various assemblies available as heat exchanger packaged units are being dis-

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tributed by The Duriron Co., Inc., Dayton 1, Ohio. The bulletins show by means of dimensioned drawings and accompanying specification charts the various heat exchanger units, consisting of pumps, pipe, fittings, and heat exchangers, all assembled on a supporting frame, that are available for application to assist in solving various engineering problems that may arise in connection with the installation of plating and processing equipment.

Link-Belt Ball Bearing Overhead Conveyor Trolleys. The Link-Belt Co., Chicago 8, Ill., has published Folder No. 2241-A which describes and illustrates in detail Link-Belt Ball Bearing Trolleys. Tables of specifications, prices, weights, and load carrying capacities are included.

"Pittsburgh Standard Industrial Enamels" is the title of a color card issued by the Pittsburgh Plate Glass Co., Industrial Paint Div., Pittsburgh 22, Pa. Color samples of the industrial enamels are attached to the color card and application recommendations, including surface preparation, are outlined.

Primer Technical Data Sheet. Primer No. 10, an air-drying and baking primer for all metals, is fully described in a technical data sheet now available from the Princeton Paint Laboratories, Room 3107, Empire State Bldg., New York 1, New York.

Filter Bulletin. The Ertel Cylinder Type Disk Filter Model ECD is described in a four-page two-color bulletin issued by Ertel Engineering Corp., Kingston, N. Y. Design features of the filter together with operating characteristics are illustrated and described in the bulletin.

"Copper Fluborate" is the title of Technical Information Manual CF-1 now being issued by the General Chemical Co., 40 Rector St., New York 6, N. Y. The 12-page two-color illustrated manual discusses copper plating, physical and chemical properties of copper fluoborate, plating bath make-up and operation, control of bath, and applications of the plating process.

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Binks Bulletin 500, containing complete information and engineering data concerning Dynapreciptor Water Wash Spray Booths, is now being issued by the Binks Manufacturing Co., 3118-40 Carroll Ave., Chicago 12, Illinois.

Water Soluble Cutting and Coloring Compounds for automatic and hand polishing are discussed and their prices listed in a leaflet available from the Special Chemicals Corp., 30 Irving Pl., New York 3, New York.

"A Faster Better Finishing Method for Metal, Plastic or Glass" is the title of a 12-page two-color folder published by the Minnesota Mining & Manufacturing Co., St. Paul 6, Minn. Described is the 3-M Wetordry Method which offers a high speed means of precision grinding and finishing, utilizing a minimum of time and materials. Interesting examples of operations in which manufacturers are using the 3-M Wetordry Method are pictured and discussed.

Link-Belt Overhead Trolley Conveyors. The utlization of Link-Belt overhead trolley conveyors to increase usable floor area is thoroughly covered in Book 230, distributed by the Link-Belt Co., Chicago 8, Ill. Profusely illustrated throughout with actual plant installation photographs, the catalog lists many different types of work for which Link-Belt products can be effectively used.

Metal Treatment Folders. Seven new folders describing metal surface treating chemicals manufactured by the company have been issued by the American Chemical Paint Co., Ambler, Pa. The six-page illustrated folders describe the following products: **Alodine** (protects aluminum, anchors the finish); **Deoxidine** (destroys rusters, bonds paint to metal, removes rust); **Duridine** (the modern metal cleaner and conditioner); **Cold Spray Granodizing** (the protective zinc phosphate coating process for steel); **Lithoform** (makes paint stick to galvanized iron); **Rodine** (efficient and economical pickling with **Rodine**); and **Thermoil-Granodine** (for unexcelled protection against rust and wear).

Each folder describes a specific metal treating chemical and outlines with the aid of illustrations the use of the chemical in production processes.

Mul Emulsion Cleaner is described in a folder issued by The DuBois Co., Cincinnati 3, Ohio, in which properties and suggested uses of the product are outlined.

Proposed American Standard Gray Finishes for Industrial Apparatus and Equipment, Z55. Four standard shades of gray, namely, light gray, medium light gray (or standard machine tool gray 7-B), medium dark gray, and dark gray, to be used in painting industrial machinery and equipment are recommended in a proposed standard for gray finishes for industrial equipment now being circulated for comment and trial use by the American Standards Association, 70 E. 45th St., New York 17, N. Y. Although the standard does not recommend that gray necessarily be used, it does suggest that when industrial equipment is painted gray, the use of these standard shades will assist in color matching and in providing improved color harmony.

NEW BOOKS

Electrolytic Polishing and Bright Plating of Metals. 1948. By S. Wernick, Ph. D., M.Sc. Published by Alvin Redman Ltd., 1-8, Whitfield Place, W.1., London, England. 243 pages. Illustrated. Price, 30 shillings (approx. $6.00).

The author discusses the development of electrolytic polishing and its application to stainless steels, carbon steels, nickel, aluminum, copper, and silver with an additional chapter on non-ferrous metals. Methods and solutions used in bright nickel plating, bright zinc and cadmium plating, bright copper plating, bright silver plating, platinum, palladium, and rhodium plating are described. An appendix outlines the development of bright nickel plating in America. A comprehensive bibliography, author index, and subject index are included in the book.

"Adhesion of Electrodeposits" is the title of A. E. S. Research Report No. 8, by A. L. Ferguson, available from the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa. Price, $1.00.

Information on the subject obtained from the literature and private commun-

ications is appraised and a study of adhesion through the use of cement is reported.

Practical Considerations in Die Casting Design. Published by The New Jersey Zinc Co., 160 Front St., New York 7, N. Y. 246 pages. Illustrated. Cloth binding, board covers. Price, $3.00.

This volume is devoted primarily to the discussion of specific applications of die castings—of all alloys now in use—and to the practical considerations involved in their design. Well illustrated throughout, the contents of the book comprise 15 chapters, as well as a bibliography and index.

"Stripping of Copper from Various Base Metals" is the title of A.E.S. Research Report No. 7, by F. C. Mathers and E. L. Martin, available from the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa. Price, $0.70.

Methods of stripping, such as the calcium polysulfide-sodium cyanide method, the sodium-polysulfide cyanide method, and the cyanide solution deplating method, are described and discussed.

Metals Handbook. 1948 edition. Published by the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. 1,444 pages. Price, $15.00.

Larger in size than any previous edition prepared by member-scientists of the ASM, this edition of the "Metals Handbook" covers the extended concepts and research which grew out of war production but which, for security reasons, were held in abeyance. Over 600 engineering and production specialists contributed over one million words on the advanced methods of producing thousands of different metal items used in making modern civilization still more modern, more comfortable, and safer.

The handbook is divided into four principal sections: General; Ferrous Metals; Nonferrous Metals; and Constitution of Alloys. Included are 74 articles on metals, processes, and methods in the General section. Among these are new summaries of wear, oxidation, stress corrosion, relief of residual stress, and service failures. 131 authoritative articles cover Ferrous Metals, from the manu-

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facture of iron and steel, through shaping, testing, structural properties, welding, heat treating and finishing to the practical business of hardening, coating, and surface treatment.

Contained in the handbook are 102 articles and 200 data sheets on Nonferrous Metals, including discussions of melting, shaping, treating, and corrosion. The handbook also contains a new section on the eight precious metals. An extensive collection of alloy phase diagrams is presented in the Constitution of Alloys section.

Practical Color Simplified. Revised edition. By William J. Miskella. Published by The Miskella Infra-Red Co., E. 73rd and Grand Ave., Cleveland 4, Ohio. 128 pages. Illustrated. Cloth binding, board covers. Price, $5.00.

As related to the finishing industry, "Practical Color Simplified" contains all of the general and important information on color choosing, color mixing, color matching, and color harmonizing incidental to practical finishing. It also contains new information on colored lighting. Written in an understandable form, the book includes many tables, color plates, and the Miskella Patented Color Chart.

The contents of the book are listed as follows: Introduction; Color Choosing; Color Mixing; Color Harmony; Color Matching; Colored Lighting; Color Photography; Color Language; Color Designation; Color Pigments; Color Testing; Color and Business; Fluorescent Lamps; and Distance Visibility Chart for Various Color Combinations.

The Proceedings of the Ninth Annual Forum of the Porcelain Enamel Institute have been assembled in booklet form and are now available for general distribution. Papers presented at the September Forum and floor discussions are included.

Topics covered are: How to Choose the Correct Type of Porcelain Enamel for Specific Applications; Demonstration and Discussion of Apparatus for Evaluation of Adherence; Panel Discussion on Different Systems of Metal Surface Preparation, including Spray Pickling, Conventional Pickle Practice, Bright Annealing, Spray Cleaning and Pickling; Fuel Oils; Use of Liquefied Petroleum Gas; Pyrometry and Its Application in Porcelain Enameling Plants; Immersion Heating Application; Importance of Selection of Proper Personnel; Employee Training; Job Evaluation and Wage Incentives; Production Planning.

A copy of the Proceedings, priced at $2.50, may be secured from the Porcelain Enamel Institute, Inc., 1010 Vermont Ave., N. W., Washington 5, D. C.

Prevention of Iron and Steel Corrosion. Compiled by C. Dinsdale. Published by The Louis Cassier Co., Ltd., and distributed by Iliffe & Sons, Ltd., Dorset House, Stamford St., London, S. E. 1, England. Price, 5 shillings (approximately $1.00, postage, 5 cents).

This book is an attempt to compile a complete index of processes and published specifications relating to the prevention of the corrosion of iron and steel.

For convenience, the book is divided into three parts, dealing with Methods of Preventing Corrosion (11 groups), Cleaning Metal Parts, and Codes of Practice. The two appendices deal with authorities issuing specifications and with paint and paint component specifications.

The Chemical Formulary. Volume VIII. By H. Bennett, Editor-in-Chief. Published by the Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 448 pages. Cloth binding, board covers. Price, $7.00.

The 1948 edition of "The Chemical Formulary" contains the latest formulae, processes, and methods to use in the preparation of marketable products. Many German formulae received from Allied Intelligence Groups, and just released, have been included. An enlarged directory of sources of chemical and supplies has been added, which should prove useful in locating new as well as old materials and products.

Chapters on the following subjects are included: Introduction; Adhesives; Cosmetics; Drug Products; Emulsions and Dispersions; Farm and Garden Implements; Food Products; Inks and Allied Products; Insecticides, Fungicides and Weed Killers; Leather Treating Preparations; Lubricants and Oils; Construction Materials; Metals and Their Treatment; Paint, Varnish, Lacquer and Other Coatings; Paper; Photography; Plastics, Rubber, Resins and Waxes; Polishes; Pyrotechnics and Explosives; Soaps and Cleaners; Textiles; and Miscellaneous.

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Article Index, 1948

Aluminum

Aluminum, Selection and Application of Primer Important in Finishing ..... January, p. 60
Aluminum, Protective and Decorative Finishes for,—Ray Swan and N. P. Ruther ..... February, p. 32
Aluminum, Preparation of for Plating ..... November, p. 94

Anodizing

Anodic Coatings on Magnesium ..... April, p. 88
Anodizing Aluminum Alloys, Importance of Proper Control in ..... July p. 78
Anodic Treatment for Magnesium, New ..... August, p. 86
Anodic Coatings on Aluminum, Properties of ..... October, p. 92

Baking

Gas-Fired Equipment Used in Baking Painted Automobile Frames ..... January, p. 86
Finishing Ovens Go "Roof Top"—Richard L. Davis ..... April, p. 36
Phenolic Resin Coatings Baked by Induction Heating ..... April, p. 74
Conveyorized Infra-Red Equipment Improves Production and Quality at Allen ..... April, p. 94
Improved Process Control and Increased Production Obtained with Radiant Heat ..... July, p. 102
Continuous Semi-Automatic Process Facilitates Insulation of Stators and Armatures ..... August, p. 90
Methods and Equipment for Baking Organic Coatings ..... December, p. 74

Barrel Finishing

Barrel Finishing of Metal Products,—H. Leroy Beaver:
Part 17—Development of Finishing Materials Used in Barrels ..... January, p. 76
Part 18—Origin of Finishing Materials Used in Barrels ..... February, p. 70
Part 19—The Use of Wood Lined Barrels for Abrasive Operation and the Relation of Barrel Size to Size of Parts to be Processed ..... March, p. 50
Part 20—Use of Pebble and Fractured Mineral Forms in Barrel Finishing ..... April, p. 58
Part 21—Application of Ceramic Barrels to the Finishing of Metal Products ..... May, p. 58
Part 22—Use of Minerals in Barrel Finishing Processes ..... June, p. 78
Part 23—Progressive Development of Steel Burnishing Materials ..... July, p. 60
Part 24—History of the Development of Barrel Finishing Materials ..... August, p. 56
Part 25—Barrel Finishing of Stainless Steels ..... October, p. 40
Part 26—Barrel Finishing and Its Relation to the Stability of Electrodeposited Surfaces ..... December, p. 38

Blackening

Formation of Black Oxide Coatings on Ferrous Articles ..... May, p. 84

Blasting

Vapor Blast for Satin Finish,—Herbert Chase ..... November, p. 58

Brushing

Clutch Plate Brushing Machine Cuts Cleaning Costs.....January, p. 90
Simple Brushing Setup Descales Conveyor Chain.....February, p. 92
Wire Brushing Provides Finish for Light Metal Parts.....April, p. 98

Buffing

Automatic Buffing Machine Speeds Finishing Operations.....June, p. 88
Buffing Aluminum, Pointers in.....September, p. 94

Cadmium Plating

Cadmium Plating at Friden, Full Automatic,—J. DeLamar Harrell.....July, P. 20

Chromium Plating

Chromium Plating and Characteristics of Deposits, Mechanism of.....May, p. 70
Chromium Plating, Preventing Excessive Trivalent Chromium Formation in.....October, p. 90

Cleaning

Cleaning Small Parts,—John E. Hyler.....March, p. 96
Proper Rinsing Following Alkali Cleaning Operations Is Important.....April, p 82
Die Castings Must Be Clean,—Arthur P. Schulze
Part 1.....July, p. 26
Part 2.....August, p. 28
Part 3.....September, p. 40
Preparation of Base Metal for Gold Plating.....July, p. 86
Metal Cleaning, Some Effects of Surface Active Agents in.....December, p. 78

Control

Automatic Temperature Control in the Finishing Department,—Frank V. Faulhaber.....February, p. 18
Plan for Plating Room Process Control,—George Black.....September, p. 28
Ferro Improved Recorder Determines Temperature Gradients.....September, p. 98
Material Control in Organic Finishing.....October, p. 88

Dust Control

Self-Contained Dust Collector Creates Dustless Backstand Sander-Grinder.....January, p. 92

Electropolishing

Electropolishing of Silver.....April, p. 80

Electrostatic Spraying

Refrigerators Painted Electrostatically at Norge.....July, p. 98
Electro-Spray Finishing of Tackle Boxes,—C. M. Long.....December, p. 32

Fire Prevention

The Fire Outrage,—Marc Maloney.....November, p. 50

Flock

Flock Coating Practices,—Arthur P. Schulze.....November, p. 22

Galvanizing

How Tank Capacity Affects Galvanizing Cost,—Wallace G. Imhoff.....May, p. 42
Conveyorized Galvanizing Process Installed at Rheem Plants.....November, p. 104

Glycerine

Glycerine in Finishes for Metal Products,—Georgia Leffingwell and Milton A. Lesser.....April, p. 46

Metallic Coatings

Protective Metallic Coatings from Salt Baths ..... March, p. 86

Nickel Plating

Significance of Stress in Electroplated Nickel ..... October, p. 78

Organic Coatings

Strippable Plastic Coating Protects Surface Finishes ..... January, p. 54
Organic Coatings for Corrosion Protection ..... February, p. 44
Finishing the Evans Space Heater,—Robert B. Evans ..... March, p. 22
Protective Organic Coatings,—L. A. Critchfield ..... March, p. 30
Surface Preparation Important in Painting Exterior Steel Surfaces ..... March, p. 92
Synthetic Rubber Derivatives As Corrosion Resistant Coatings ..... April, p. 86
Plastic Coating Protects Chrome Plated Parts During Assembly ..... April, p. 98
Spray Versus Brush Application on Exterior Steel Surfaces ..... May, p. 90
Nitrocellulose Lacquers Are Versatile Finishing Materials ..... June, p. 62
Finishing Small Parts on a Production Basis,—Rollin H. Wampler ..... July, p. 50
Non-Metallic Coatings for the Protection of Steel ..... July, p. 88
Future Trends in Alkyd Resins for Protective and Decorative Coatings ..... August, p. 80
Luminous Paint Compounds,—Joseph M. Oxenhorn ..... September, p. 22
Production of Consistently High Quality Wrinkle Finishes Requires Proper Control ..... September, p. 84
Mechanism of Film Formation in Organic Coatings ..... November, p. 90
Finishing Washer Tubs and Machines,—R. A. Moore ..... December, p. 54
Proper Spray Gun Technique Essential for Economical Finishing ..... December, p. 84

pH

Standardization of the pH Scale, National Bureau of Standards ..... February, p. 80

Passivity

Passivity of Corrosion Resistant Alloys ..... May, p. 80
Passivation Important in Surface Finishing of Stainless Steel ..... September, p. 76

Phosphating

Chemical Treatment Improves the Corrosion Resistance of Tin Plated Steel ..... January, p. 72
Modern Finishing Techniques Boost Production of Tracy "Customized" Kitchens ..... July, p. 94
Surface Preparation for Organic Finishing ..... November, p. 76

Plating

Rapid Small Parts Handling Features Buick Plating Setup,—Herbert Chase ..... January, p. 16
Barrel Nickel and Chromium Plating ..... January, p. 68
Sources of Impurities in Plating Solutions ..... February, p. 54
Scientific Methods are Available for Treating Plating Room Wastes ..... March, p. 74
Ultra-Modern Plating Setups Employed at G. E. Plant,—Herbert Chase ..... April, p. 24
Plating on Magnesium, Dow Process for ..... June, p. 90
Pointers in Rinse Tank Design ..... August, p. 84
DC Power Transmission in the Plating Room ..... September, p. 90
Streamlined Bumper Production,—Ezra A. Blount ..... October, p. 20
Continuous Carbon Treatment of Plating Solutions May Contribute to Quality Plating ..... November, p. 86
Plating Decorative Automotive Hardware,—Henry R. Hawkinson ..... December, p. 20
Recent Engineering Developments in Piping and Heating Plating Baths ..... December, p. 60

Porcelain Enameling

How to Choose the Correct Type of Porcelain Enamel for Specific Applications,—J. E. Hansen ..... January, p. 28
Addition of Alumina to Porcelain Enamel Frits Improves High Temperature Corrosion Resistance ..... February, p. 58
Mechanized Porcelain Enameling of Steel Tubs,—Fred M. Burt ..... May, p. 14
Acid Resisting Enamel Range Tops Produced with One Coat of Porcelain Enamel ..... June, p. 96

Rhodium Plating

Increased Use of Rhodium Plating ..... September, p. 106

Safety

Use Solvents Safely ..... October, p. 34

Specifications

Engineered Purchase Specifications Aid Industry, Business, and Government ..... December, p. 26

Spray Booths

Water Wash Spray Booth Operations,—Fred M. Burt ..... August, p. 14
Spray Booth Coatings,—Rollin H. Wampler ..... October, p. 56

Testing

Testing Surface Preparation ..... January, p. 58
Electrographic Printing of Pores in Protective Coatings ..... February, p. 62
Testing Instrument Measures Porcelain Enamel Adherence by Magnetic Counting ..... February, p. 90
Abrasion Testing of Anodized Coatings,—Arthur P. Schulze ..... March, p. 66
A New Instrument for Measuring the Flexibility and Adhesion of Surface Coatings ..... March, p. 88
Take Guesswork Out of Metal Identification,—George Black ..... May, p. 30
Thickness Measurements of Plated Coatings ..... June, p. 48
Coverage Tests of Finishing Materials ..... June, p. 58
Spot Test for the Detection of Cadmium Plate ..... June, p. 62
Slot Plating Test Cell ..... June, p. 66
Accelerated Exposure Testing of Organic Coatings ..... July, p. 72
Recent Developments in Surface Finish Measurement ..... August, p. 70
Finish Testing Device Stimulates Service Conditions ..... September, p. 102

Zinc Plating

Modern Zinc Plating Installation ..... November, p. 100

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6 U.S. Four Speed Polishing and Buffing Lathes available immediately at an attractive price, in excellent condition, less than half original price. 220-440 volt, 60 cycle, 3 phase. Write Box 121, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

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This Opportunity Section is available for classified advertisements. For advertising rates and other information address:

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Nationally known manufacturer of metal finishing and metal treating materials requires services of a chemical or metallurgical sales engineer for metropolitan New York and northern New Jersey. Furnish qualifications and experience to Box 122, c/o Products Finishing, 431 Main St., Cincinnati 2, Ohio.

Representative Wanted

Well known manufacturer of metal finishing and metal treating materials has opening in Detroit territory for established jobber or manufacturer's representative to promote and handle sales. Please include qualifications and experience in reply to Box No. 129, c/o Products Finishing, 431 Main Street, Cincinnati 2, Ohio.

The Finishing Touch — **By J. A. Patterson**

"What about this, McNammara — the men back here complain you're a pretty hard man to work with?"

CATALOGS

FOR YOUR LIBRARY

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Roxaprene
A brochure outlining detailed specifications for drying, application, adhesion, flexibility, resistance to chemicals, and other properties of Interchem Roxaprene Low Bake Finish has been issued by the Interchemical Corp., Finishes Division, 57 State St., Newark 1, New Jersey.

2. Solvent Degreasing
A 16-page booklet which emphasizes fundamental practices for the economical use of degreasing solvents in metal cleaning departments of industrial plants and describes typical kinds of degreasers has been published by the Detrex Corp., Box 501, Roosevelt Park Annex, Detroit 32, Michigan.

3. Synthetic Resins
A 20-page technical booklet which includes a description of the properties and uses of all Hercules synthetic resins is now available from the Hercules Powder Co., Inc., Wilmington, Delaware.

4. Industrial Lacquers
A color card containing samples of the variety of colors of Pittsburgh industrial lacquers for wood and metal, together with suggestions for application of the lacquers, has been issued by the Pittsburgh Plate Glass Co., Industrial Paint Division, Pittsburgh, Pennsylvania.

5. Backstand Polishing
Case histories involving plants using the "3M Backstand Method" are discussed in a booklet being distributed by the Minnesota Mining & Manufacturing Co., St. Paul 6, Minnesota.

6. Zinc Fluoborate
Technical Information Manual ZF-1 containing extensive data on high speed and tank and barrel plating with Zinc Fluoborate, including operating details, bath make-up, analytical methods, and so on, is being issued by the General Chemical Fluorine Division, 40 Rector St., New York 6, New York.

7. Polishing Wheels
Data on a wide variety of polishing wheels for all metals, as well as on abrasives, glue, and accessory products, are contained in a bulletin now being offered by the Hanson-Van Winkle-Munning Co., Matawan, New Jersey.

8. Metal Cleaning Equipment
A folder telling how seven famous companies solved their production cleaning problems is now being issued by The Alvey-Ferguson Co., 631 Disney St., Cincinnati 9, Ohio.

9. Process Equipment
An eight-page general catalog issued by The Duriron Co., Inc., Dayton 1, Ohio, provides a brief description of a complete line of corrosion resisting equipment, including pumps, pipes, valves, heat exchangers, steam jets, and so on.

10. Surface Conditioning
Oakite CrysCoat Process, a precise surface-conditioning procedure for cleaning, rustproofing, and phosphatizing steel parts in one quick application, is the subject of a special service report released by Oakite Products, Inc., 32F Thames St., New York 6, New York.

11. Flexible Lacquers
The Randolph Products Co., Carlstadt, N. J., is now offering technical information and specifications on flexible lacquers which can be sprayed, dipped, or baked.

12. Filters
Alsop Engineering Corp., 304 Keen St., Milldale, Conn., is now issuing a profusely illustrated book designated as Catalog P-347 explaining the fundamentals of filtration for various plating applications.

13. Clear Lacquers
A booklet describing six clear lacquers for metal and entitled, "Is There a Better Metal Finish Than the One You Now Use?", has been issued by The Egyptian Lacquer Manufacturing Co., P. O. Box 444, Newark, New Jersey.

14. Buffs
A complete line of buffs for every buffing requirement, as well as polishing wheels and compositions, are described in a six-page illustrated folder released by The Udylite Corp., 1651 E. Grand Blvd., Detroit 11, Michigan.

15 Synthetic Finish
"Dimenso," a synthetic finish that is designed to provide two colors in one spray operation, is described in a booklet now available from The Sherwin-Williams Co., Cleveland 1, Ohio.

16. Alodizing
A rapid, effective, and economical process for protecting aluminum and anchoring paint is described in a four-page illustrated technical service data sheet released by the American Chemical Paint Co., Ambler, Pennsylvania.

17. Metal Parts Cleaning
An illustrated bulletin describing equipment and detergents for modern metal parts cleaning operations is now being offered by the Optimus Equipment Co., 133 Church St., Matawan, N. J.

18. Infra-Red Ovens and Conveyors
A 20-page catalog published by Jensen Specialties, Inc., 9331 Freeland Ave., Detroit 27, Mich., illustrates and explains the advantages of coordinating infra-red ovens with conveyors in performing baking, drying, preheating and dehydrating operations in a wide variety of fields.

19. Dust Eliminators
A 12-page folder prepared by Schmieg Industries, Inc., 314 Piquette Ave., Detroit 2, Mich., presents illustrated, descriptive, and blueprint data on a complete line of swirl type dust and fume eliminators for industry.

20. Parkerizing
A catalog describing applications and advantages of Parkerizing has been issued by the Parker Rust Proof Co., 2172 E. Milwaukee Ave., Detroit 11, Mich. Coatings obtainable by Parkerizing various products such as forgings, castings, stampings, and so on, are discussed.

21. Fabricated Alloys
A catalog descriptive of its custom-built carriers for various processing operations is now being issued by Rolock, Inc., 1400 Kings Highway, Fairfield, Connecticut.

22. Fan Systems
A descriptive booklet "Fan Systems for Various Industries" has been issued by the Kirk & Blum Mfg. Co., 2816 Spring Grove Avenue, Cincinnati 25, Ohio.

23. Silicone-Base Finish
Properties of Mico silicone-base aluminum finish and product applications for the finish are outlined in a folder issued by Midland Industrial Finishes Co., Waukegan, Illinois.

24. Filter Powder Data Sheets
MacDermid, Inc., Waterbury 88, Conn., is offering technical data sheets on Metex Filter Powder for both cyanide and bright nickel solution filtering.

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Name ..... Title.....
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Index to Advertisements

Abbott Ball Co. 40
Acme Mfg. Co. 117
Advance Paint Co. 41
Allied Finishing Specialties Co. 56
Allied Research Products, Inc. 64
Allwood Lime Co. 118
Alsop Engr. Corp. 51
Alvey-Ferguson Co. 27, 91
American Chemical Paint Co. 49
American-Marietta Co.,
Ferbert-Schorndorfer Div. 6, 7

Baker & Co., Inc. 8
Blakeslee & Co., G. S. 28

Cambridge Wire Cloth Co. 85
Carborundum Co. 9
Chemco Products Co., Inc. 129
Codman Co., F. L. & J. C. 115
Columbia Electric Mfg. Co. 42
Cowles Chemical Co. 18

Darco Corp. 105
Davis-K-Products Co. 124
Despatch Oven Co. 127
Detrex Corp. ..... Fourth Cover
Detro Mfg. & Sales Co., Inc. 44, 126
Dust Suppression & Engr. Co. 101

Eclipse Air Brush Co. 97
Edmont Mfg. Co. 125
Egyptian Lacquer Mfg. Co. 4

Ferro Enamel Corp. 61
Fostoria Pressed Steel Corp. 36, 37
Fuller Brush Co. 111

General Chemical Div.,
Allied Chemical & Dye Corp. 47
General Electric Co., Lamp Div. 39

Hammond Mchry. Builders, Inc. 14, 15
Hanson-Van Winkle-Munning Co. 3
Harding Mfg. Co. 46
Harrison & Co., Inc. 78
Harshaw Chemical Co. 65
Hercules Powder Co. 69
Holland & Sons, Inc., J. 96

Interchemical Corp., Finishes Div. ..... Second Cover
International Nickel Co., Inc. 13

Jackson Buff Corp. 70, 71
Jensen Specialties, Inc. 43

Keystone Emery Mills 120
Kirk & Blum Mfg. Co. 16

Lacquer & Chemical Corp. 126
Link-Belt Co. 10

Maas & Waldstein Co. 45
MacDermid Inc. 87
Magnus Chemical Co., Inc. 113
Mahon Co., R. C. 58, 59
Mechanical Process Co. 123
Metalwash Mchry. Co., Inc. 80

National Rack Co. 104
Neilson Chemical Co. 11
Newcomb-Detroit Co., Inc. 67
Niederst Co. 50
Norton Co. 2

Oakite Products, Inc. 1
Optimus Equipment Co. 72

Parker Rust Proof Co. 77
Peters-Dalton, Inc. 52, 53
Phelps-Dodge Refining Corp. 100
Pittsburgh Plate Glass Co., Brush Div. 93
Production Machine Co. 94

Quinn Co., Nelson J. 81

Randolph Products Co. 17
Ransohoff, Inc., N. 75
Rayon Processing Co. of R. I. 103
Roberts Rouge Co. 83

Sarco Co., Inc. 12
Schmieg Industries 79
Sherwin-Williams Co. 30, 31
Simonds Abrasive Co. 119
Singleton Co. 62
Standard Varnish Works ..... Third Cover
Stevens, Inc., Frederic B. 35
Striplastic Co. 121
Stuart Industrial Service, Inc. 92
Sulphur Products Co. 98

Torit Mfg. Co. 95

Udylite Corp. 29
United Chromium, Inc. 57

Varnish Products Co. 102

Williamsville Buff Div., Bullard Clark Co. 73

Young & Bertke Co. 48
Young Brothers Co. 99

Zapon Div., Atlas Powder Co. 63